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CONSOLIDATED LISTING OF RECENT OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the OFFICIAL GAZETTE *from July 1, 1964, through December 31, 1976. These notices and rule changes are currently in effect unless otherwise noted.*

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INFORMATION AND CORRESPONDENCE

(1) OFFICIAL PATENT OFFICE MAILING ADDRESS REMAINS WASHINGTON, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

(Office name change per Public Law 93–596, Jan. 2, 1975)

[860 O.G. 662]

(2) GROUP NUMBER SHOULD APPEAR ON COMMUNICATIONS RELATING TO PENDING APPLICATIONS

It is again requested that the Group number be typed on amendments and other communications relating to pending applications in order to expedite the handling of mail and to conserve manpower. The number of the Group should be placed on the right-hand side, opposite the Serial Number or name of applicant. In view of the vast amount of mail, continued careful attention to these details will do much toward avoiding delay in handling of mail.

C. A. KALK,
Nov. 6, 1969. *Director of Administration.*

[869 O.G. 345]

(3) IDENTIFICATION FOR APPLICATION CORRESPONDENCE

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on the Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL–85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

RICHARD A. WAHL,
Mar. 5, 1971. *Assistant Commissioner.*

[885 O.G. 2]

(4) IDENTIFYING APPLICATION CORRESPONDENCE WITH ISSUE BATCH NUMBER

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Jan. 16, 1976. *Assistant Commissioner for Administration.*

[943 O.G. 519]

(5) HAND DELIVERY OF PAPERS

The notices of November 10, 1969 (869 O.G. 345) and September 8, 1970 (879 O.G. 667), regarding "Hand Delivery

of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examining Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

WILLIAM FELDMAN,
Jan. 29, 1974. *Deputy Assistant Commissioner for Patents.*

[919 O.G. 1070]

(6) POST CARD RECEIPT REMINDER

Applicants and their attorneys or agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

RICHARD A. WAHL,
Nov. 21, 1968. *Assistant Commissioner.*

[857 O.G. 667]

(7) STATUS INQUIRIES

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also be recognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL–327 in *every* case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL–327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL–85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL–327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the OFFICIAL GAZETTE are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response to an Office action. In the latter instance the mailing date of the Office action will also be given.

The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

(8) CHANGE OF ADDRESS

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice of change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 28, 1975.

[935 O.G. 1352]

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(9) CHANGE OF ADDRESS OR PRACTITIONER IN A PLURALITY OF PATENT APPLICATIONS

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations of power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

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(10) ACCESS TO PATENT APPLICATION AND INTERFERENCE FILES

In order to insure that access to patent application and interference files is given only to persons who are entitled thereto or who are specially authorized to have access under Rule 14 of the Rules of Practice in Patent Cases, and to insure also that the file record identifies any such specially authorized person who has been given access to a file, the following practice will be observed by all personnel of the Patent Office:

1. Access, as provided for in the Rules of Practice, will be given on *oral request* to any applicant, patentee, assignee, or attorney or agent of record in an application or patent only upon *proof of identity* or upon *recognition* based on personal acquaintance.
2. Where a power of attorney or authorization of agent was given to a registered firm prior to July 2, 1971, access will be given upon oral request as in paragraph 1 above to any registered member or employee of the firm who has signatory power for the firm.
3. Unregistered employees of attorneys or agents, public stenographers, and all other persons not within the provisions of paragraphs 1 and 2 above will be given access only upon presentation of a *written authorization for access* signed by a person specified in paragraph 1 above, which authorization will be entered as a part of the official file.

ROBERT GOTTSCHALK,
Nov. 24, 1971. *Acting Commissioner of Patents.*

[893 O.G. 810]

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(11) EXPRESS MAIL

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

May 15, 1975.

[936 O.G. 1554]

(12) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

Certificate of Mailing of Correspondence

On June 21, 1976, notice was published in the Federal Register (41 FR 24895) of a proposal to amend Title 37, Code of Federal Regulations by adding new §§ 1.8, 3.55 and 4.23. Interested persons were invited to comment on the proposal on or before August 20, 1976. Twenty-two comments were submitted. Nineteen were favorable to the proposal and two were neutral. One adverse comment was received. Consideration was given to these comments, as well as to 147 comments received in response to an earlier notice published in the OFFICIAL GAZETTE of the Patent and Trademark Office on January 20, 1976 (942 O.G. 1073). Of these 147 comments, 131 were in favor of a certificate of mailing procedure, 11 were opposed and 5 were neutral. Both sets of comments, and a summary and analysis of each set, are available for public inspection in Room 11E10 of Crystal Plaza Building 3 at 2021 Jefferson Davis Highway in Arlington, Virginia.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. Except in those cases spelled out in new § 1.8, papers and fees will be considered as being timely filed if they are deposited with the U.S. Postal Service on or before the expiration of the period set for response. However, the date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The exceptions spelled out in new § 1.8 are intended to exclude from the new procedure those cases where filing in the Office, or with the Commissioner, is a requirement of statute. In view of five comments questioning the authority of the Commissioner to adopt the new procedure, two further exceptions have been included in § 1.8. In all other cases, the new procedure would not be inconsistent with statute, and therefore would be within the authority of the Commissioner to adopt. The suggestion, advanced in eight comments, that there should be no exceptions, was not adopted.

One comment suggested that attestation be made on a personal knowledge basis and this suggestion has been adopted. In response to another comment, the text of § 1.8 has been amended to indicate more clearly who may sign the certificate. Finally, several comments expressed concern about the possibility of fraud. However, the use of a post card receipt (see Notice dated November 21, 1968) would seem to minimize this possibility.

The addition of a new § 1.8(a) establishes a Certificate of Mailing procedure. New § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Form § 3.55 is designed for use in patent cases and form § 4.23 is designed for use in trademark cases when making a certificate under § 1.8(a).

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Parts 1, 3 and 4 of Title 37, Code of Federal Regulations, are hereby amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of patent applications;

(ii) The filing of trademark applications;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act, 15 U.S.C. 1059;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act, 15 U.S.C. 1064(a), 1064(b);

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065;

(viii) The filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or Section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Customs and Patent Appeals;

(ix) The filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under Section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2); and

(x) The filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

(b) In the event that correspondence or fees are timely filed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under § 1.68 or §2.20 which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing.

PART 3—FORMS FOR PATENT CASES

2. By adding a new §3.55 as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ----------.
Date

Name of applicant, assignee, or
Registered Representative

Signature

Date

PART 4—FORMS FOR TRADEMARK CASES

3. By adding a new § 4.23 as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ----------.
Date

Name of applicant, assignee, or
applicant's attorney

Signature

Date

Effective date: These amendments shall become effective on November 1, 1976.

Dated: September 28, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: September 17, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76-28915; Filed 10-1-76; 8:45 am]

[951 O.G. 1342]

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(13) CERTIFICATE OF MAILING PROCEDURES

The Patent and Trademark Office has promulgated new Rules 1.8 and forms 3.55 and 4.23 which establish a new Certificate of Mailing Procedure, effective November 1, 1976.

In order to assist the Patent and Trademark Office in the effective handling of these certificates, the following guidelines are suggested.

Location of Certificate

The preferred location for the Certificate of Mailing is at the end of any correspondence mailed to the Office. In those situations where the certificate accompanies a fee or other form such as the issue fee transmittal form PTO-85, which does not have space for a certificate, the certificate should appear on a separate cover letter which refers to the accompanying paper. When a separate cover letter is used, a clear identification of the type of correspondence should be included.

Although not specifically required by the rule, it is preferred that the certificate be signed by the applicant, assignee, or attorney. The certificate should be signed separately from the correspondence itself. Suggested wording of the certificate is set forth in form 3.55 for patent cases and form 4.23 for trademark cases.

A separate certificate should be made for papers filed in each individual application, if papers for several different applications are mailed in a single envelope.

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period.

WILLIAM FELDMAN,
Oct. 26, 1976. *Deputy Assistant Commissioner for Patents.*

[952 O.G. 918]

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(14) AVAILABILITY OF U.S. PATENT CLASSIFICATION SUBCLASS LISTING MICROFILM

The Patent and Trademark Office announces the availability of the 7th edition of the microfilm publication "U.S. Patent Classification—Subclass Listing" (Patent and Trademark Office Publication PAT-002:1-7604-M), which is offered for sale through the National Technical Information Service (NTIS).

This publication presents in sequence by the classes, subclasses and digests of the official U.S. Classification, the patent numbers of the U.S. patents which are classified as "originals," "cross references," and "unofficial cross references" in each of the subclasses. Within each subclass, the patent numbers are listed in numerical sequence. Symbols appear in conjunction with patent numbers to denote those patents which are cross-reference classified in a subclass.

All U.S. patents issued through March 1976 (including through patent number 3,947,895, reissue patent 28,754, design patent 239,419, and plant patent 3,855) and all reclassification through order number 519 are included in this publication. It supersedes the publication dated June 1974.

The entire publication consists of 10 reels of 16 mm negative microfilm which is priced as listed below. A choice of 3M or Recordak cartridges or "Thread Easy" magazines is offered, as well as plain reels.

Reel Number	Accession Number*	Classes
1-10	PB 255 750	All.
1	PB 255 751	D1-D99, 2-29.
2	PB 255 752	30-68.
3	PB 255 753	69-105.
4	PB 255 754	106-148.
5	PB 255 755	149-198.
6	PB 255 756	199-235.
7	PB 255 757	236-260 (through subclass 326s).
8	PB 255 758	260 (remainder)-296.
9	PB 255 759	297-339.
10	PB 255 760	340-528.

*Purchaser should add the appropriate single letter code to the accession number to represent the manner in which the film is to be supplied:
P=Plain reel in box.
M=Reel in 3M cartridge.
R=Reel in Recordak cartridge.
T=Reel in "Thread Easy" magazine.

The reels are priced as follows:

		Domestic	Foreign
Full set (PB 255 750)	Plain reels	$42	$57
	Cartridges	$42	$77
Individual reels	Plain reels	$6	$7.50
	Cartridges	$8	$9.50

Address orders to:

National Technical Information Service
U.S. Department of Commerce
Springfield, Va. 22161

Enclose payment in check or money order or authorization to charge the amount of the order to the purchaser's NTIS deposit account or American Express Card, giving the account number.

ALFRED C. MARMOR,
Aug. 24, 1976 *Administrator for Documentation.*

[951 O.G. 3]

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(15) SUBSTITUTE POWERS OF ATTORNEY

The Patent and Trademark Office has recently received correspondence in certain applications under the title "Substitute Power of Attorney" wherein the principal attorney of record attempted to name other attorneys as his substitute in those applications.

Since the power of the principal attorney may be revoked, or terminated as by his death, revocation or termination of said power of the principal attorney will also terminate the power of those appointed by him. Thus, a principal attorney may appoint an associate attorney whose power terminates with that of the principal, but he may not appoint a "substitute" and any attempt by the principal to appoint a "substitute" attorney whose power survives his own shall not be recognized by the Office.

WILLIAM FELDMAN,
Dec. 17, 1975. *Deputy Assistant Commissioner for Patents.*

[942 O.G. 1074]

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(16) CHANGE IN LEGAL HOLIDAYS

Those doing business before the Patent Office are hereby reminded that by Public Law 90—363, 82 Stat. 250, effective January 1, 1971, Section 6103(a) of Title 5, United States Code, was amended to read as follows:

§ 6103. *Holidays*

(a) The following are legal public holidays:
New Year's Day, January 1.
Washington's Birthday, the third Monday in February.
Memorial Day, the last Monday in May.
Independence Day, July 4.
Labor Day, the first Monday in September.
Columbus Day, the second Monday in October.
Veterans Day, the fourth Monday in October.
Thanksgiving Day, the fourth Thursday in November.
Christmas Day, December 25.

Each of the holidays enumerated will constitute "a holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code.

WILLIAM E. SCHUYLER, JR.,
Dec. 2, 1970. *Commissioner of Patents.*

[881 O.G. 1707]

EDITORIAL NOTE: Sec. 6103(c) states that January 20 of each fourth year after 1965, Inauguration Day, is also a legal public holiday.

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(17) RELOCATION OF CUSTOMER RELATIONS CENTER

In order to expand facilities in the Public Search Room of the Patent and Trademark Office, it has become necessary to relocate the Customer Relations Center.

As of January 19, 1976, the Center was moved to Building No. 2, Room 4C08. The telephone number of the Center will continue to be (703) 557–2003.

WILLIAM I. MERKIN,
January 1976. *Acting Assistant Commissioner for Administration.*

[943 O.G. 519]

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(18) AVAILABILITY OF PATENT APPLICATION DRAWINGS FOR REPRODUCTION

Clients of private commercial reproduction services requesting patent application drawings to make drawing reproductions for U.S. and foreign filings have caused printing problems and delays in allowed applications in which the Base Issue Fee has been paid.

In order to prevent any delay in the printing and issuance of applications in which the Base Issue Fee has been paid, access to the drawings of patent applications which have been scheduled for printing will not be normally available. Delays in obtaining patent application drawings by commercial reproduction services, after the application has been scheduled for printing, can be avoided if requests for reproductions are made either before or promptly after receipt of the Notice of Allowance and prior to the payment of the Base Issue Fee.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.
May 6, 1975.

[934 O.G. 1324]

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(19) PUBLIC SEARCH ROOM FOR PATENTS

Establishment of New Procedures and Revisions of Regulations

One of the major obligations of the Patent and Trademark Office is to make patent information available for public inspection. The quality of this service depends upon promoting an environment conducive to research and maintaining the integrity of the files in the Public Search Room for Patents.

To emphasize our commitment to providing this environment with complete and orderly files for public use, the Patent and Trademark Office is establishing new procedures and revising the Regulations for using the facilities of the Public Search Room for Patents. The new procedures and revised Regulations will become effective August 23, 1976. The new procedures for the Search Room include the requirement that users obtain and show, prior to entering the Search Room facilities, a User Pass. This pass can be obtained at a special desk near the guard station. User Passes will be issued to persons not under prohibition from using the search facilities who agree to abide by the Regulations of the Public Search Room for Patents by signing a statement to that effect. User Passes are non-transferable and are valid until reissue or revocation for cause.

The new procedures also include the requirement that persons entering and exiting the Search Room use designated lanes. Persons exiting the Search Room will automatically pass electronic sensing equipment designed to detect any marked documents or materials being removed from the Search Room. The sensing equipment is capable of detecting marked documents and materials in briefcases and parcels and under clothing. The equipment does not use X-ray or other high energy radiation and is, therefore, completely safe and harmless to persons, photographic film, magnetic tape and electronic or mechanical devices such as wristwatches. The Patent and Trademark Office is now preparing older documents in the Classified and Application files for use under this system. All new patents are marked for sensing before being placed in the Classified files.

Whenever a marked document is transported past the sensing equipment, Patent and Trademark Office officials and the security guards will be alerted to the removal of the document, and a gate on the exit lane will lock. Persons triggering the alarm will be asked to cooperate in identifying the source for the alarm. Failure to cooperate when the alarm is triggered could result in detention of the person, seizure of any briefcase or the like, or other legal measures deemed necessary and appropriate in the specific case.

In order to assure that the changes in the Search Room fully apply to the Record Room, the entrance to the Record Room will be relocated within the Search Room. This change is currently under way.

The revised Regulations for the Search Room appear below, and a reprinting of the Regulations brochure incorporating the revisions will soon be available in the Search Room. The substance of the changes in the procedures and the revised Regulations for the Search Room, as well as any pertinent information that will assist users in the changeover, will be prominently posted in the Search Room. In order to maintain an environment conducive to research, the revised Regulations will be strictly enforced.

Although these new procedures and revised Regulations may cause some inconvenience, it is hoped that with your understanding and cooperation they will result in improvement in search facilities which will benefit all participants in our patent system.

REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS OF THE PATENT AND TRADEMARK OFFICE

The Public Search Room for Patents is defined as that area comprising the foyers off the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices, Microfilm Center, restrooms and telephone areas off these foyers; the stacks, Record Room, study and copier areas between the foyers; and the Mezzanine.

Under applicable statutes and regulations, including 49 U.S.C. 486(c); 41 CFR Subpart 101–20.3 and appropriate Sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Public Search Room for Patents.

1. All persons using these facilities are subject to the regulations governing conduct on Federal Property, as specified in 41 CFR Subpart 101–20.3.
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. Food and beverages in any form are not to be consumed except in designated areas.
5. Loud talking, use of radios, or any other form of activity which may disturb other members of the public is forbidden.
6. Children brought into the Public Search Room for Patents must not be allowed to disturb others.
7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.
8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.
9. Patents and records shall not be removed from the facilities without proper authorization; nor shall they be mutilated. The unlawful removal or mutilation of records is forbidden by law and is punishable by fine or imprisonment or both (18 U.S.C. 2071).

10. The presence or use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission. The use of dictating equipment is prohibited, except in designated areas.
11. Library trucks or carts are to be used for transporting bundles only. They are not to be used for storage while making searches.
12. Patents temporarily removed from bundles for copying must be replaced promptly.
13. All bundles of patents must be promptly replaced in the stacks by the user.
14. The reserving of seats and/or working areas is prohibited.
15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Search Room after 5:00 p.m.
16. The front portion of the Public Search Room for Patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling, shall not be occupied by users after 6:00 p.m.
17. A valid User Pass must be shown upon request to authorized Patent and Trademark Office personnel.
18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark Office personnel upon request.
19. Packages, briefcases or other personal effects are subject to search by authorized Patent and Trademark Office personnel upon request.
20. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents, and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

C. MARSHALL DANN,
July 9, 1976. *Commissioner of Patents and Trademarks.*

[949 O.G. 2]

RECORDS AND FILES

(20) ACCESSIBILITY OF ASSIGNMENT RECORDS

In view of a number of inquiries as to the manner in which Rule 1.12 of the Patent Office Rules of Practice, as amended August 23, 1965 (819 O.G. 443) is to be applied, the procedure which it is planned to follow in certain types of cases is set forth below.

1. Assignments relating to applications for registration of trademarks will be open to public inspection as heretofore.

2. The Office will not open certain parts on'y of an assignment document to public inspection. If such a document contains two or more items, any one of which, if alone, would be open to such inspection, then the entire document will be open. Thus, if an assignment covers either a trademark or a patent in addition to one or more patent applications, it will be available to the public ab initio; and if it covers a number of patent applications, it will be so available as soon as any one of them is patented. Assignments relating only to one or more pending applications for patent will not be open to public inspection.

3. If the application on which a patent was granted is a division or continuation of an earlier case, the assignment records of that case will be open to public inspection; similar situations involving continuation in part applications will be considered on their individual merits.

4. Assignment records relating to reissue applications will be open to public inspection.

EDWARD J. BRENNER,
Dec. 15, 1965. *Commissioner.*

[822 O.G. 769]

(21) NOTIFICATION RE: CONFLICT IN ASSIGNMENT IN CERTAIN APPLICATIONS

Effective September 12, 1966, Assignment Branch will discontinue mailing notification in cases where there is a conflict in assignment between an original application and its divisional, continuation, substitute, or continuation-in-part application.

Assignments from original applications are applied without charge ONLY to divisional, continuation, or substitute applications where the date of the assignment is prior to the filing date of the later-filed application. (Continuation-in-part applications require separate assignments if they are to be issued to the assignee.)

Practitioners are reminded of the provisions of Rule 334. Unless an assignment is filed at or prior to the date of payment of the issue fee, the patent will normally be issued in the name of the inventor.

Section 306 of the Manual of Patent Examining Procedures will be amended appropriately.

W. R. ARMSTRONG,
Director, Office of Patent Services.

Concurred:
(signed) R. A. WAHL,
Assistant Commissioner.

[830 O.G. 442 (Sept. 12, 1966)]

(22) RECORDING OF INSTRUMENTS

Effective April 1, 1967, the Patent Office will accept and record legible certified copies of original assignments or other instruments.

The certified copy, if not in the English language, will not be recorded unless accompanied by a translation signed by the translator.

Certification shall be to the fact that the instrument submitted is a true copy of the original and shall be made by a notary public or, if in a foreign country, by a consular officer of the United States or an officer authorized to administer oaths and authenticated by a consular officer of the United States.

RICHARD A. WAHL,
Mar. 3, 1967. *Assistant Commissioner.*

[836 O.G. 1111]

(23) REMINDER

Furnishing Assignment Data at Time of Payment of Base Issue Fee

Practitioners are once again reminded of Rule 334, revised November 1969, which requires that . . . "At the time of payment of the issue fee, a statement must be furnished indicating whether or not an assignment has been filed with the Patent Office. In the event an assignment has been filed, such statement must include the name of the assignee and indicate whether or not an acknowledgment of a recorded assignment has been received from the Patent Office."

The Issue Fee Transmittal Form POL 85*b*, revised December 1969 and May 1973, provides space (Item 2) for Assignment Data which should be completed to comply with the Rule. Unless an assignee's name and address are identified in Item 2 of the Issue Fee Transmittal Form POL 85*b*, the patent will issue to the applicant. *Assignment Data printed on the patent will be based solely on information so supplied.*

A request for correction of error arising from incomplete or erroneous information furnished in Item 2 of POL 85*b* will not be granted as a matter of course and will be subject to adherence to all the requirements of Rule 323.

The recording of instruments in the Assignment Division is not affected by this Notice.

WILLIAM I. MERKIN,
Dec. 19, 1974. *Assistant Commissioner for Administration.*

[930 O.G. 984]

(24) CERTIFIED COPIES OF APPLICATION AS ORIGINALLY FILED

The Patent Office has discontinued placing the assignments of record on the file wrapper of patent applications, except

when a title report is requested or upon allowance of the case. Accordingly, the copies of applications prepared in response to requests for a certified copy of a patent application as filed, will no longer include an indication of assignments. Applicants desiring an indication of assignments of record should request separately certified copies of assignment documents.

ROBERT J. RISH,
Acting Assistant Commissioner for Administration.

[887 O.G. 1042 (6-22-71)]

(25) ASSIGNEE NAMES

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the *same* party are identified on the Base Issue Fee Transmittal form, POL-85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL-85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL-85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

Dec. 17, 1975. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[942 O.G. 186]

FEES AND PAYMENT OF MONEY

(26) FEES IN CONNECTION WITH AMENDMENTS TO PATENT APPLICATIONS

This notice supplements the Notice of September 10, 1965, 818 O.G. 1207, September 28, 1965, relating to the administration of the act of July 24, 1965, Public Law 89-83, increasing certain fees payable to the United States Patent Office.

That act provides for the payment of additional fees on presentation of certain claims during the prosecution of applications. This provision applies in the case of applications filed on or after October 25, 1965, the effective date of the act. In such cases, when any amendment is filed which presents additional claims over the total number covered by fees previously paid, it should be accompanied by any additional fees due.

As in the case of claims presented after an application is filed and before first action, described in the Notice of September 10, 1965, when independent claims are subsequently presented so that the number of uncanceled independent claims in the application as amended exceeds the number of such claims paid for, an additional fee of $10 is due for each such additional claim. Similarly, an additional fee of $2 is due for each claim added in excess of the number of uncanceled claims, independent or dependent, already paid for.

Treatment of Amendments Unaccompanied by Fees Due

Amendments filed during and after the prosecution of an application and not accompanied by the entire fee due upon such filing will be treated as follows:

If such an amendment is filed in reply to an Office action it will be regarded as not being fully responsive thereto and the practice set forth in section 714.03 of the Manual of Patent Examining Procedure will be followed, care being taken to avoid any abuse of this practice by attorneys as, for example, by habitual submission of such amendments without fees or with insufficient fees.

If an amendment which is not filed in response to an Office action is of such a nature as to require a fee and is not accompanied by the full fee required, it will not be entered and the applicant will be so advised.

Amendment During Interference

An amendment filed in connection with a motion to add counts to an interference (Rule 233) must be accompanied by the claim or claims to be added and with the appropriate fees, if any, which would be due if the amendments were to be entered. It may be that the amendments will never be entered. Only upon the granting of the motion is it necessary for the other party or parties to present the claims, but the fees must be paid whenever presented.

Claims which have been submitted in response to a suggestion by the Office for inclusion in an application must be accompanied by the fee due, if any.

Amendment After Requirement for Restriction

After a requirement for restriction or election of species, nonelected claims will be included in determining the fees due in connection with a subsequent amendment unless such claims are canceled.

Refunds

Money paid in excess or by mistake in connection with an amendment will be refunded in the usual manner.

Amendments affecting the claims cannot serve as the basis for granting any refund.

Money paid in connection with the filing of a proposed amendment will not be refunded by reason of the nonentry of the amendment.

EDWARD J. BRENNER,
Jan. 13, 1966. *Commissioner of Patents.*

[823 O.G. 814]

(27) DEPOSIT ACCOUNTS—STATUTORY FEE CHARGES

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

(28) PRACTICE IN THE USE OF ACCOUNTS FOR PAYMENT OF STATUTORY FEES

In the OFFICIAL GAZETTES of March 15, 22, and 29, there appeared copies of an announcement by the Commissioner providing for a trial use of accounts established under Rule 25 for the payment of statutory fees. A number of questions have come up in connection with the use of accounts in the payment of these fees prescribed by Public Law 89–83 and, in the interest of uniform practice, publication of a statement is warranted.

A general direction by an applicant or attorney to charge to an account these fees as they arise in any application prosecuted by the applicant, the attorney, or the firm will not be effective for such a purpose. Authority to make charges will be limited to a particular application.

A separate direction to charge shall be filed for each fee. Each such direction to charge a fee shall be transmitted on a separate sheet of paper and, in the case of fees based on modification of claims shall include the best estimate of the fee due. Failure to include such an estimate provides the basis for a refusal to enter any amendment transmitted therewith, as an incomplete response. Where variable fees are involved inclusion of a direction to charge or credit a deficiency or overpayment would appear appropriate.

An issue fee will not be charged to an account until a notice of allowance has been forwarded and a reply to that notice received.

For the purposes of determining the fee due the Patent Office, a claim will be treated as dependent if it contains reference to one other claim in the application. A claim determined to be dependent by this test will be entered if the fee paid reflects this determination. This does not, however, prevent the rejection of such a claim as improper, if, in fact, it is not a dependent claim.

EDWARD J. BRENNER,
Apr. 12, 1966. *Commissioner of Patents.*

[825 O.G. 1183]

(29) DEPENDENT CLAIMS

Although the notice published on October 5, 1965, in 819 O.G. 3, explained that for the purposes of the present fee bill, Public Law 89–83, approved July 24, 1965, the Patent Office will consider a proper dependent claim as being one which incorporates by reference a single preceding claim, whether independent or dependent, and includes all the limitations of the claim so incorporated, there appears to be still some uncertainty on this matter and it is therefore thought to be desirable to elaborate it.

Since the initial determination, for fee purposes, as to whether a claim is dependent must be made by persons other than examiners, it is necessary, at that time, to accept as dependent virtually every claim which refers to another claim, without determining whether there is actually a true dependent relationship. Such acceptance does not, however, preclude a subsequent holding by the examiner that a claim is not a proper dependent claim.

An essential characteristic of a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim. Thus, for example, if claim 1 recites the combination of elements *a*, *b*, *c* and *d*, a claim reciting the structure of claim 1 in which *d* was omitted or replaced by *e* would not be a proper dependent claim, even though it placed further limitations on the remaining elements or added still other elements.

The fact that a dependent claim which is otherwise proper might require a separate search or be separately classified from the claim on which it depends would not render it an improper dependent claim, although it might result in a requirement for restriction.

The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. On the other hand, if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim if the product might be made in other ways.

Any claim which is in dependent form but which is so worded that it does not, in fact, include every limitation of the claim on which it depends, will be required to be cancelled as not being a proper dependent claim; and cancellation of any further claim depending on such a dependent claim will be similarly required. The applicant may thereupon amend the claims to place them in proper dependent form, or may redraft them as independent claims upon payment of any necessary additional fee.

The basis for the difference in fees between independent and dependent claims is the fact that the examination of a dependent claim is normally a comparatively simple matter after the claim on which it depends has been examined. This relationship, however, obtains only when the independent claim represents a bona fide attempt to define the invention and to distinguish it from the known prior art. Accordingly, the presentation of a claim which on its face is obviously unpatentable or indefinite, as basis on which other claims are dependent, is not considered to be proper practice. One example of such a practice involves the use of a claim drawn to "all the features of novelty herein disclosed," with other claims, which actually recite the features thought to be novel, being dependent on the first. A similarly objectionable arrangement would involve the use, as a basic independent claim, of a claim merely reciting "a wheeled vehicle," "an amino acid" or "an internal combustion engine."

Such a practice as that just described involves not only an attempt to evade the fee provisions of Public Law 89–83, but also the presentation of a claim known by the attorney or agent presenting it to be unpatentable. Any registered patent attorney or agent who makes a practice of presenting claims of this character may be called on to explain his actions.

(signed) EDWARD J. BRENNER,
June 8, 1966. *Commissioner.*

[828 O.G. 1]

(30) DEPOSIT ACCOUNTS

The practice instituted on May 1, 1966, pursuant to the notice of February 23, 1966 (824 O.G. 1200), whereby statutory fees may be charged against deposit accounts, and such accounts are closed if overdrawn, has resulted in certain difficulties for the Patent Office and deposit account holders. It has been decided therefore to modify that practice as indicated below.

As was pointed out in that notice, the charging of a fee against an overdrawn account cannot be considered as payment of the fee until a proper balance is restored or payment is made in some other way. Accordingly, deposit account holders who charge such fees must assume the risk of losing vital dates if they do not maintain a proper balance in their accounts at all times.

Apart from this, however, the overdrawing of an account places a burden on the Patent Office, particularly where a number of items are charged after the overdraft occurs, and it is appropriate that those who are responsible for causing such a condition should bear the cost of correcting it. In view of this fact, and of the hardship frequently caused if an account is permanently closed, the practice of closing deposit accounts merely because they are overdrawn will be discontinued, effective August 1, 1966. In lieu thereof an overdrawn account will be immediately suspended and no charges will be accepted against it until a proper balance is restored, together with a payment of ten dollars to cover the work done by the Patent Office incident to suspending and reinstating the account and dealing with charges which may have been made in the meantime. It is expected, however, that reasonable precautions will be taken in all cases to avoid overdrafts, and if an account is suspended repeatedly it will be necessary to close it.

Similarly, because of the burden placed on the Patent Office incident to the operation of deposit accounts, a charge of ten dollars will be made for opening each new account.

EDWARD J. BRENNER,
June 23, 1966. *Commissioner.*

[828 O.G. 377]

APPLICATION CONTENT

(31) GUIDELINES FOR DRAFTING A MODEL PATENT APPLICATION UNDER THE REVISED RULES

The following guidelines illustrate the preferred layout and content for patent applications. They have been prepared to supplement the amendments to the rules which are effective January 1, 1967. These guidelines are suggested for the applicant's use.

Arrangement and Contents of the Specification

The following order of arrangement is preferable in framing the specification and, except for the title of the invention; each of the lettered items should be preceded by the headings indicated.

(a) Title of the Invention.
(b) Abstract of the Disclosure.
(c) Cross-References to Related Applications (if any).
(d) Background of the Invention.
  1. Field of the Invention.
  2. Description of the Prior Art.
(e) Summary of the Invention.
(f) Brief Description of the Drawing.
(g) Description of the Preferred Embodiment(s).
(h) Claim(s).

(a) *Title of the Invention:* (See Rule 72(a).) The title of the invention should be placed at the top of the first page of the specification. It should be brief but technically accurate and descriptive.

(b) *Abstract of the Disclosure:* (See Rule 72(b), MPEP 608.01(a), and 831 O.G. 1328, October 25, 1966.)

(c) *Cross-References to Related Applications:* (See Rule 78 and MPEP 201.11.)

(d) *Background of the Invention:* The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions. The statement should be directed to the subject matter of the claimed invention.

(2) Description of the Prior Art: A paragraph(s) describing to the extent practical the state of the prior art known to the applicant, including references to specific prior art where appropriate. Where applicable, the problems involved in the prior art, which are solved by the applicant's invention, should be indicated.

(e) *Summary:* A brief summary or general statement of the invention as set forth in Rule 73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(f) *Brief Description of the Drawing:* A reference to and brief description of the drawing(s) as set forth in Rule 74.

(g) *Description of the Preferred Embodiment(s):* A description of the preferred embodiment(s) of the invention as required in Rule 71. The description should be as short and specific as is necessary to adequately and accurately describe the invention.

Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field to which the invention pertains, form a part of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(h) *Claim(s):* (See Rule 75.) A claim may be typed with the various elements subdivided in paragraph form. There may be plural indentations to further segregate subcombinations or related steps.

Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims.

Claims should preferably be arranged in order of scope so that the first claim presented is the broadest. Where separate species are claimed, the claims of like species should be grouped together where possible and physically separated by drawing a line between claims or groups of claims. (Both of these provisions may not be practical or possible where several species claims depend from the same generic claim.) Similarly, product and process claims should be separately grouped. Such arrangements are for the purpose of facilitating classification and examination.

The form of claim required in Rule 75(e) is particularly adapted for the description of improvement type inventions. It is to be considered a combination claim and should be drafted with this thought in mind.

In drafting claims in accordance with Rule 75(e), the preamble is to be considered to positively and clearly include all the elements or steps recited therein as a part of the claimed combination.

Oath

(See Rule 65.) Where one or more previously filed foreign applications are cited or mentioned in the oath, complete identifying data, including the application or serial number as well as the country and date of filing, should be provided.

EDWARD J. BRENNER,
Date: Oct. 12, 1966. *Commissioner of Patents.*

[832 O.G. 5]

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(32) USE OF METRIC SYSTEM OF MEASUREMENTS IN PATENT APPLICATIONS

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

C. MARSHALL DANN,
July 1, 1974. *Commissioner of Patents.*

[924 O.G. 1104]

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(33) FILING OF NON-ENGLISH LANGUAGE APPLICATIONS

This notice is in response to inquiries regarding the filing of applications in a language other than English. The Office has received a few such applications in the past in emergency situations where the filing of a non-English language specification was the only possibility of saving a foreign priority date or preventing the running of a statutory bar. In such situations the Office practice has been to accord the application a filing date if it includes all of the component parts required

by 35 U.S.C. 111, and to require applicant to submit a verified translation of the previously filed application within two months.

In view of the inquiries received, it is considered appropriate that the Office clarify and publicize its practice in this area to avoid misunderstandings.

Accordingly, beginning February 1, 1976, the Office will accord a filing date to an application meeting the requirements of 35 U.S.C. 111 even though some or all of the application papers, including the written description and the claims, is in a language other than English and hence does not comply with 37 CFR 1.52, *provided:*

(1) the oath or declaration is signed and physically attached to the specification and claims to which it refers; and

(2) the application papers are accompanied by a statement, in English, from the applicant, his attorney or agent, certifying that is has been considered necessary to file the non-English language application in order to save a foreign priority date or prevent the running of a statutory bar.

A verified English translation of the non-English language papers should either accompany the application papers or be filed in the Office no later than two months after a notice requesting the translation has been mailed by the Office.

A subsequently filed verified English translation must contain the complete identifying data for the application in order to permit prompt association with the papers initially filed. Accordingly, it is strongly recommended that the original application papers be accompanied by a cover letter and a self-addressed return post card, each containing the following identifying data in English: (*a*) applicant's name(s); (*b*) title of invention; (*c*) number of pages of specifications, claims, and sheets of drawings; (*d*) whether oath or declaration was filed and (*e*) amount and manner of paying the filing fee.

The translation must be a literal translation verified as such by the translator, and must be accompanied by a signed request from the applicant, his attorney or agent, asking that the verified English translation be used as the copy for examination purposes in the Office. If the verified English translation does not conform to idiomatic English and United States practice it should be accompanied by a preliminary amendment making the necessary changes without the introduction of new matter prohibited by 35 U.S.C. 132. In the event the verified literal translation is not timely filed in the Office the application will be regarded as abandoned.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be routinely used for filing applications. There are at least two reasons why this should not be used on a routine basis. First, there are obvious dangers to applicant and the public if he fails to obtain a correct literal translation. Second, the filing of a large number of applications under the procedure will create significant administrative burdens on the Office.

The practice will be closely monitored to determine whether or not it should be continued.

C. MARSHALL DANN,
Dec. 31, 1975. *Commissioner of Patents and Trademarks.*

[942 O.G. 1552]

EXAMINATION OF APPLICATIONS

(34) INFORMAL APPLICATIONS OF FOREIGN APPLICANTS

This Notice is of special interest to attorneys and agents prosecuting applications on inventions originating abroad.

Many applications filed in this Office correspond in form and substance to the requirements (regulations) of countries foreign to the United States. Since they were not originally drafted to comply with our Rules of Practice, especially those based on 35 U.S.C. 112, the first examination cannot be the full and complete one contemplated under current examining procedures. This first examination is necessarily limited, under MPEP 702.01, to pointing out the informalities and citing the results of a search, the search being based upon the invention so far as it can be understood from the foreign type of claims, often coupled with a somewhat generalized disclosure. Since U.S. Patent Office policy is to accord equal treatment to *all* cases regardless of origin, current examining procedures as explained in the address reprinted in 803 O.G. 893, subject these applications to final determination on the second action. It is obviously to applicant's advantage to *file* the application with an adequate disclosure and with claims which conform to the U.S. Patent Office usages and requirements. This should be done whenever possible. If, however, due to the pressure of a Convention deadline or other reasons, this is not possible, applicants are urged to submit *promptly, preferably within three months after filing,* a preliminary amendment which corrects the obvious informalities. The informalities should be corrected to the extent that the disclosure is readily understood and the claims to be initially examined are in proper form, particularly as to dependency, and otherwise clearly define the invention. "New matter" must be excluded from these amendments since preliminary amendments do not enjoy original disclosure status, section 608.04(b), MPEP.

EDWARD J. BRENNER,
Mar. 4, 1965. *Commissioner of Patents.*

[812 O.G. 1295]

(35) EXAMINATION OF CLAIMS FOR PATENTABILITY UNDER 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic.

"A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.,* 163 USPQ 673 (decided December 8, 1969).

"Office policy has consistently been to follow *Graham* v. *John Deere Co.,* 148 USPQ 459 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test.

"The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and a 'synergistic result,' but clearly decided whether the claimed inventions were unobvious on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test.

"Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

July 8, 1976.

C. MARSHALL DANN,
Commissioner of Patents & Trademarks.

[949 O.G. 3]

(36) CLAIMS COPIED FROM PATENTS

Applicants and their attorneys or agents are reminded of the requirement of Rule 205(b) (37 CFR 1.205(b)) of the Rules of Practice that "Where an applicant presents a claim copied or substantially copied from a patent, he must, at the time he presents the claim, identify the patent, give the number of the patented claim, and specifically apply the terms of the copied claim to his own disclosure, unless the claim is copied in response to a suggestion by the Office."

The requirement of Rule 205(b) (37 CFR 1.205(b)) applies to claims copied in an application at the time of filing as well as to claims copied in an amendment to a pending application. If an applicant, attorney, or agent presents a claim copied or substantially copied from a patent without complying wtih Rule 205(b) (37 CFR 1.205(b)) the examiner may be led into making an action different from what he would have made had he been in possession of all the facts. Therefore, failure to comply with Rule 205(b) (37 CFR 1.205(b)), when submitting a claim copied from a patent, may result in the issuance of an Order To Show Cause why the application should not be stricken from the files of the Patent Office. If a satisfactory answer is not filed within the period set in the Order it may be necessary to strike the application under Rule 56 (37 CFR 1.56).

This reminder is being published to emphasize to applicants and their attorneys or agents the importance of complying with the requirement of Rule 205(b) (37 CFR 1.205(b)) at the time the claim is copied.

WILLIAM FELDMAN.

Apr. 10, 1974. *Acting Assistant Commissioner for Patents.*

[922 O.G. 442]

(37) EXAMINATION OF PATENT APPLICATIONS HAVING AN ISSUE OF FRAUD

This notice deals with the general procedures established within the Patent Office for the handling, during ex parte examination, of applications in which, or in relation to which, some facts appear or representations are made raising an issue of fraud.

Such applications should be forwarded by the examiner to the Office of the Assistant Commissioner for Patents as soon as the facts or representations are discovered. The application will then be reviewed and a determination made as to whether immediate action on the issue of fraud is necessary or whether the consideration of such an issue should be delayed until after the normal ex parte examination by the examiner (if such examination has not previously taken place).

Where compelling reasons dictate immediate action, the application will not be returned to the examining group for normal ex parte examination until such action is complete. Otherwise, the application will be returned to the examining group. The examiner will complete the examination as to all matters except that any issues relating to possible fraud will not be considered or commented upon. When this examination is completed the application will be returned to the Office of the Assistant Commissioner for Patents. An investigation will then be undertaken to resolve the issues relating to the possible fraud. Such an investigation may include a requirement for additional information from applicant, or from the examiner, should it be necessary for the proper conduct of the investigation.

If the investigation reveals a prima facie case of fraud an Order to Show Cause why the application should not be stricken under Rule 56 of the Rules of Practice [37 CFR 1.56] will be issued.

If a prima facie case of fraud does not exist, or is adequately rebutted, a decision will be entered in the application file stating that the Patent Office has found no evidence necessitating striking the application. The application will then be returned to the examining group or other appropriate Patent Office section for further action.

WILLIAM FELDMAN,

Jan. 2, 1975. *Acting Assistant Commissioner for Patents.*

[930 O.G. 1455]

(38) PRACTICE RE MARKUSH-TYPE CLAIMS

This notice deals with Markush-type claims which include a plurality of alternatively usable substances or members. In most cases this recitation by enumeration is used because there is no appropriate or true generic language.

Where an application claims two or more independent and distinct inventions, the Commissioner, under the provisions of 35 U.S.C. 121, may require the application to be restricted to one of the inventions.

A Markush-type claim is directed to "independent and distinct inventions," if two or more of its members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

If the claim is of that nature, the examiner is authorized to reject it as an improper Markush claim and for misjoinder under 35 U.S.C. 121 and to require the applicant to restrict the application to a single invention. In making such a requirement, the examiner will (1) clearly delineate the members or groups of members believed to constitute improperly joined inventions, and (2) state reasons fully explaining why they are independent and distinct. Applicant's response to such a requirement should be an election of a single adequately disclosed and supported invention, with or without restriction of the claim(s) to that invention. Of course, the response must not introduce new matter into the application. See 35 U.S.C. 132 and *In re Welstead*, 59 CCPA 1105, 463 F. 2d 1110, 174 USPQ 449 (1972). A refusal to elect a single invention will be treated as a non-responsive reply.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it is directed to independent and distinct inventions. In such a case, the examiner will not follow the procedure outlined in the preceding paragraph and will not require restriction.

Where the examiner has rejected the claim and required restriction and the applicant has responded without restricting the claim(s) to a single invention, the examiner shall, if the position is adhered to, again reject the claim and any other Markush claims not restricted to the elected invention. No further examination of these claims is required unless and until such rejection has been overcome. However, if the search of the single elected invention develops prior art which would render both the elected invention and the improper Markush claim(s) unpatentable, such prior art may be applied in rejections of both without a complete search of the subject matter of the improper Markush claim(s). Otherwise, only true generic claims and those restricted to the elected invention will be examined in the usual manner.

Review of the rejection will be by appeal to the Board of Appeals under 35 U.S.C. 134.

C. MARSHALL DANN,

May 1, 1974. *Commissioner of Patents.*

[922 O.G. 1016]

(39) RESTRICTION BETWEEN INVENTIONS

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of con-

clusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Apr. 9, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 450]

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(40) CITATION OF PRIOR ART BY APPLICANTS

The purpose of this notice is to set forth positive guidelines for applicants, their attorneys and agents who desire to submit prior art for consideration by the Patent Office. Such citations of relevant art are welcomed and are encouraged. In order that they may be most effectively considered by the examiner, however, with as little disruption of the regular examination process as possible, it is requested that they be submitted in accordance with the following guidelines.

(1) Citations should be submitted within three months after the application filing date if possible. Any citation made after the first action on the merits (if this occurs more than three months after filing) should be accompanied by an explanation of why it was not earlier presented. This may take the form of a statement that it was made as soon as the art or other material was discovered, or as soon as its pertinency was appreciated, indicating the date of discovery of the cited material or its pertinency.

(2) Full text copies of the pertinent portions of all such prior art citations or other material relevant to patentability of the claimed invention should be supplied, whether the citation is made in a separate paper or in the specification of the application. This will be unnecessary in the case of pending or abandoned United States applications (e.g. Defensive Publications). In the case of publications, a copy of the title page, its copyright notice or other indication of a publication date, and copies of the entire pages which contain the text of the relevant material will be sufficient.

While patent copies are, of course, available in the Patent Office, failure of the applicant to include copies of the cited art means that the examiner must interrupt his examination until copies can be ordered and received. Since the person making the citation will have copies in hand, an overall saving in time and more expeditious examination will result if copies are supplied with the citation.

(3) If the reference is not in English, a translation of its pertinent portions should be included.

(4) Accompanying each citation should be an indication of its pertinency to the claimed subject matter, together with any reasons applicant may wish to point out why the claims are considered to be patentable over the cited material.

All citations of prior art or other material submitted in accordance with the above guidelines and submitted before all claims have been indicated as allowable will be fully considered by the examiner.

While the Patent Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other material not submitted in accordance with these guidelines will be considered by the examiner. Consequently, any patent issuing on the application in question would not be expected to be accorded the usual presumption of validity with respect to such cited art or material.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an *Ex parte* Quayle action, a notice of allowability (POL–327), an examiner's amendment (POL–37), or a Notice of Allowance, any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by :

(*a*) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought ;
(*b*) A timely affidavit under Rule 131 with respect to the material cited ; or
(*c*) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other material cited raises a serious question as to the patentability of the claimed subject matter.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under Rule 183 (37 CFR 1.183) requesting a waiver of Rule 312 (37 CFR 1.312). Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

Submitted citations will not in any way diminish the obligation of examiners to conduct independent prior art searches, or relieve examiners of citing pertinent prior art of which they may be aware, whether or not such art is cited by the applicant. Nothing in this notice is intended to relieve applicants of any responsibility they may have to cite known prior art to the Patent Office.

If the specification or a separate paper filed in the application contains citations relating to background material, applicant has the responsibility of determining whether or not such material is sufficiently relevant to the claimed invention that full compliance with these guidelines is necessary.

Prior art submitted by applicant in the manner provided herein will not be supplied with an Office action, but will be listed on the Form PO–892, "Notice of References Cited," along with other prior art relied upon by the examiner during the examination. Only that prior art listed by the examiner on Form PO–892, will be printed on the patent. However, the complete listing of applicant's citations will be in the application file and will be available for inspection by the public after issuance of the patent.

Citations of prior art may be placed of record in the patented file after the grant of the patent at the request of the patentee (see Section 100(*d*) of Title 35, United States Code, for definition of patentee). Any such submissions by the patentee will be placed in the patented file without comment by the Patent Office. Citations submitted to the Patent Office by third parties will not be placed in the record of a patented file unless the party submitting the art certifies that he has sent the owner of record copies of the cited art and of his letter transmitting it to the Patent Office.

Prior Notices

This notice supersedes the notices of :
December 10, 1963 (797 O.G. 733)
April 24, 1964 (802 O.G. 601)
June 22, 1964 (804 O.G. 1)
July 24, 1964 (805 O.G. 294)
April 13, 1967 (837 O.G. 1032)

WILLIAM FELDMAN,
Aug. 12, 1974. *Deputy Assistant Commissioner for Patents.*

[926 O.G. 2]

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(41) CITATION OF PRIOR ART BY APPLICANTS

This notice supplements the notice of August 12, 1974, published in the OFFICIAL GAZETTE of September 3, 1974 (926

O.G. 1), and is in response to some of the concerns expressed by members of the patent bar. That notice set forth guidelines the following of which would result in assurance by the Office that the examiner will fully consider the prior art or other material submitted by applicants, their attorneys and agents.

One of the guidelines stated, "If the reference is not in English, a translation of its pertinent portions should be included." In recognition of the high costs of translations, that guideline is hereby modified to accept an alternative to a translation. Accordingly, in lieu of a translation, it shall be sufficient, for purposes of the notice of August 12, 1974, if an equivalent English language patent or publication is provided and identified as an equivalent.

Also, where the applicant has submitted prior art in accordance with the guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application. Of course, any change in applicant's position regarding the cited art and its relevancy to the claimed subject matter should be indicated.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 19, 1975.

[935 O.G. 902]

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(42) "MERE FUNCTION OF MACHINE"—REJECTION

In view of the decision of the Court of Customs and Patent Appeals in *In re Tarczy-Hornoch* appearing at 158 USPQ 141, process or method claims will no longer be subject to a rejection by Patent Office examiners solely on the ground that they define the inherent function of a disclosed machine or apparatus. Accordingly, the subject matter of MPEP 706.03(r) is inapplicable and hereby cancelled.

RICHARD A. WAHL,
Assistant Commissioner.

Feb. 10, 1969.

[861 O.G. 343]

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(43) EXPRESS ABANDONMENTS

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138.

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(l) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application. The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 7, 1975.

[934 O.G. 2]

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(44) ENVIRONMENTAL QUALITY

In signing the National Environmental Policy Act on the first day of this decade, President Nixon declared, "The 1970's absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters and our living environment." This landmark legislation declares that it is the continuing policy of the Federal Government to use all practicable means and measures to foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans. The Act further directs that, to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act.

In accordance with the desires of the President and this mandate of the Congress, the Patent Office will accord "special" status to all patent applications for inventions which materially enhance the quality of the environment of mankind by contributing to the restoration or maintenance of the basic life-sustaining natural elements—air, water, and soil. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the applications by serial number and filing date, and should be accompanied by affidavits or declarations under Rule 102 explaining how their inventions contribute to the restoration or maintenance of one of these life-sustaining elements.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Jan. 29, 1970.

[871 O.G. 673]

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(45) APPLICATIONS RELATED TO ENERGY

In his Message of April 18, 1973, to The Congress "Concerning Energy Resources," the President stated that "with 6 percent of the world's population, we consume almost a third of all the energy used in the world." The President noted that our energy demands "now outstrip our available supplies, and at our present rate of growth, our energy needs a dozen years from now will be nearly double what they were in 1970." The President's Message of April 18 called for the development of a more comprehensive, integrated national energy policy and announced specific steps to carry out the policy. On June 29, 1973, the President announced a series of additional actions to deal with the Nation's energy problem. Among those actions were major efforts in energy research and development and in energy conservation.

In order to enhance and further the goals and actions announced by the President, the Patent Office will, on request,

accord "special" status to all patent applications for inventions which materially contribute to (1) the discovery or development of energy resources, and (2) the more efficient utilization and conservation of energy resources. Examples of inventions in category (1) would be those relating to further developments in fossil fuels (natural gas, coal, and petroleum), nuclear energy, solar energy, etc. Category (2) would include inventions relating to the reduction of energy consumption in combustion systems, industrial equipment, household appliances, etc. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under rule 102 by the applicant or his attorney or agent explaining how the invention materially contributes to category (1) or (2) set forth above.

Requests should be addressed to the Commissioner of Patents, Washington, D.C. 20231.

RENE D. TEGTMEYER,
Date: Oct. 26, 1973. *Acting Commissioner of Patents.*

Approved:

BETSY ANCKER-JOHNSON, Ph.D.,
Assistant Secretary for Science and Technology.

[916 O.G. 2]

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(46) RECORD OF INTERVIEWS IN PATENT APPLICATIONS

Applicants and their attorneys or agents are reminded that a complete written statement as to the substance of any interview with regard to an application must be made of record in the application, whether or not an agreement with the examiner was reached at the interview. The necessity to so complete the record of an application is emphasized by the requirements of Rules 2 and 133(b). Rule 2 provides in part that

> "All business with the Patent Office should be transacted in writing.
>
> * * * * *
>
> "The action of the Patent Office will be based exclusively on the written record in the Office."

Obviously, the action of the Patent Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews. In addition to the requirement of Rule 2, Rule 133(b) is specific that

> "In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for response to Office actions as specified in Rules 111, 135."

Applicants and their attorneys or agents are responsible for compliance with the requirement for a complete written statement except in those situations in which it is agreed that the examiner will issue an Office action upon the application without further written response on behalf of applicant. In those situations, the examiner will make the substance of the interview of record in the Office action. The examiner may also complete the record of an interview if significant matters are inadvertently omitted from a written statement filed on behalf of applicant.

Noncompliance on behalf of applicant with the above noted requirement for a complete written statement when filing a response, will result in the applicant being given one month from the date of the notifying letter or the remainder of any period for response, whichever is longer, to complete the response and thereby avoid abandonment of the application (Rule 135(c)). Except for the paragraphs under the heading "EXAMINER TO CHECK FOR ACCURACY" the substance of this notice supersedes Section 713.04 of the Manual of Patent Examining Procedure.

WILLIAM FELDMAN,
Aug. 9, 1974. *Deputy Assistant Commissioner for Patents.*

[926 O.G. 2]

(47) STATEMENTS FILED UNDER ATOMIC ENERGY ACT AND NASA ACT

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(c) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (a) the full facts in regard to the making or conception of the invention, and (b) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an application which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or printed forms which set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the statements must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have first-hand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
Aug. 13, 1973.

[914 O.G. 2]

(48) PATENT EXAMINING AND APPEAL PROCEDURES

[37 CFR Part 1]

Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in section 6 of Title 35 of the United States Code, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.175, 1.194, 1.196, 1.291, 1.292 and 1.346, and by adding §§ 1.69, 1.97, 1.98, 1.99 and 1.109.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, on or before December 7, 1976, on which date a hearing will be held at 9:30 a.m. in Room 11–C24, Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. All persons wishing to be heard orally at the hearing are requested to notify the Commissoner of their intended appearance. All comments received will be available for public inspection in Room 11–E10 of Building 3.

This proposal has been reviewed pursuant to EO 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

BACKGROUND

The purpose of the proposed changes is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures.

In recent years there has been extensive public discussion concerning the U.S. patent examining system. Much of it stemmed from the 1966 Report of the President's Commission on the Patent System. The Commission made 35 recommendations for improvements, most of them requiring legislation. As a result, bills were introduced in the 90th Congress in 1967 and hearings were held on those and subsequent bills. The most recent patent bill to receive Congressional attention, S. 2255, 94th Congress, was passed by the Senate on February 26, 1976. It now appears, however, that no patent legislation will be enacted during the current year.

Certain of the proposals that have been made in the various bills can be implemented under the Commissioner's rulemaking authority and within the confines of the Office's current budget. In other cases more limited changes can be implemented in this way. Since it may be some time before the law is revised, it is believed appropriate at this time to consider rule changes of this nature. The Patent and Trademark Office has prepared the present proposals after a review of the various bills and taking into account comments and suggestions received from interested parties.

In addition to strengthening examining and appeal procedures, the proposed rules might serve as models for subsequent legislation or simplify the patent law revision effort by dispensing with the need for certain legislative changes. The proposed rules are intended to: (1) permit patent owners and others to bring new prior art to the attention of the Office more readily through reissue applications; (2) assist examiners by providing them with "patentability statements" in all applications; (3) define and clarify the duty of applicants and others to bring information relevant to pending applications to the attention of the examiner; (4) modify the requirements for oaths and declarations to help ensure that relevant information is disclosed; (5) make available to the public Office decisions that would be of important precedent value; (6) refine the existing rules governing public use proceedings and protests to the grant of patents; (7) modify appeal procedures to authorize, in appropriate cases, oral arguments by examiners and rejections of allowed claims by the Board; and (8) create a more complete record of reasons for allowing patents.

REISSUE APPLICATIONS

Proposed § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. Existing § 1.175 requires reissue applicants to file an oath or declaration alleging that they believe "the original patent to be wholly or partly inoperative or invalid * * *" This requirement is dispensed with in proposed § 1.175(a)(1) unless the applicant believes this to be the case. New paragraph (a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus the proposed section permits a patentee to file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure could be used at any time during the life of a patent. During litigation a court might, if it chose, stay proceedings to permit new art to be considered initially by the Office in a simpler and less expensive proceeding. In accordance with existing § 1.176, reissue applications will continue to be acted on by the examiner in advance of other applications.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 U.S.C. 251 does not authorize reissue of a patent unless it is "deemed wholly or partly inoperative or invalid." However, the record of prosecution of the reissue application will indicate that the prior art has been considered by the examiner.

Proposed § 1.11 opens reissue applications to inspection by the general public. It is already Office policy to open reissue applications to inspection by opponents of the patentee in litigation or an interference at the opponent's request. The proposed rule opens all reissue applications. Since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

Proposed § 1.11(b) provides for announcement of the filings of reissue applications in the OFFICIAL GAZETTE. This announcement would give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. However, in accordance with proposed § 1.291 members of the public will not be permitted to participate as parties in proceedings before the examiner. See discussion below.

PATENTABILITY STATEMENT

Proposed §§ 1.97–1.99 provide for the filing of a patentability statement, similar to what has sometimes been called a patentability "brief," in every patent application. The statement would assist examiners by informing them of the relevant prior art considered by the applicant and giving an explanation of the most relevant references before they undertake their searches. The statement is not intended to serve as a substitute for the search by the examiner, but only as a starting point and supplement for the search. The statement should provide a more complete written record distinguishing the claims from the prior art.

While the statement will impose some additional burden on applicants, applicants are already required by existing law to bring pertinent information to the attention of the examiner. The statement will serve as a reminder to applicants, attorneys and agents of their responsibility for citing pertinent information.

The patentability statement proposal represents an extension of the Office's existing policy on citation of prior art by applicants.[1] The proposal is similar to the rule change proposal published on September 9, 1969,[2] and to section 131(b) of S. 2255, 94th Congress.

Proposed § 1.97(a) requires the statement to be filed within two months after filing an application, in order to make it available by the time of the examiner's first action. Paragraph (b) makes clear that applicants will not be refused an examination or a patent for any inadvertent failure to comply with the requirements for the statement. Paragraph (c) is intended to avoid any inference as to the thoroughness of any search that is made, or any implied obligation to make any search at all.

Section 1.98(a), specifying the content of the statement, requires a listing of relevant information and a "concise" explanation of the references considered most relevant. This emphasizes that a lengthy legal document is not desired. The term "patentability brief" is avoided because the statement contemplated generally would be less detailed than an appellate brief. Only the key features of pertinent references and the most important differences from the claimed invention need be discussed in a few sentences.

Section 1.98(a) states that the statement is to explain why the invention is patentable over prior art which the appli-

[1] See notice of August 12, 1974, 926 O.G. 2.
[2] 34 FR 14176, 866 O.G. 1402.

cant considered most "relevant" during preparation of the application. The term "relevant" is defined. As to the "most relevant" references, the requirement is for an explanation of those references which meet this qualification in the opinion of the applicant, which will not necessarily be the same as the opinion of the examiner or subsequent reviewing body. The requirement that only the most relevant references need be explained is an attempt to minimize extra burden on the applicant and the Office.

It of course requires persons to exercise judgment in deciding what information to cite. No way has been found to avoid the exercise of judgment if the examiner is to be provided only with information useful to him. The intent of the Office is to avoid penalizing persons for good faith errors in judgment in deciding what information to bring forward. Reasons for patentability need not be stated if no relevant information was considered in preparing the application. The statement could comprise a mere statement that no information was considered.

Proposed § 1.98 requires, except in the case of duplicative references, that a copy of the pertinent portion of each patent or publication considered relevant be submitted. This includes copies of United States patents as well as foreign patents. While patents are of course available in the Office, if the applicant does not include copies the examiner will have to interrupt his examination until copies can be ordered or located. Since the person making the citation has copies in hand, it is believed that an overall saving in time can be achieved by requiring the applicant to supply the copies in all cases. With the widespread availability of copying equipment this burden is now less than in the past. While translations of pertinent portions of foreign language references will be helpful to the examiner, this has not been made a requirement of the proposed rule. When existing translations are readily available they should be submitted.

Proposed § 1.99 provides for updating patentability statements. This is consistent with the duty under existing case law to cite relevant information at any time during the prosecution of an application.

DUTY OF DISCLOSURE

Proposed § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The proposal codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the Federal courts. The expanded wording of § 1.56 is intended to be helpful especially to those individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and, although not binding on them, may perhaps offer useful guidance to the courts.

The first sentence of § 1.56(a) names the individuals who have a duty to disclose information to the Office. The second sentence states that the duty is to disclose all information that they believe might reasonably be expected to affect a decision of the examiner.[3] It is somewhat more than that information which in fact would or should cause the examiner to reject claims allowable "but for" the information.[4] As noted below, however, paragraph (c) of proposed § 1.56 does not necessarily provide for a penalty when relevant information is not disclosed. The third sentence of paragraph (a) makes clear that the duty of disclosure is less for those persons who are less involved in the preparation or prosecution of the application.

Proposed § 1.56(b) retains the substance of existing § 1.56 and further defines with more particularity the grounds for striking an application. Since the courts have held patents unenforceable under the equitable doctrine of unclean hands when the requirements for fraud in the common law sense are not met, the term "inequitable conduct" is added to the rule. Paragraph (b) also makes clear that a failure to comply with the duty of disclosure may amount to fraud or inequitable conduct.

Paragraph (c) sets forth the criteria that must be satisfied before an application will be stricken for failing to comply with the duty of disclosure. It is believed to reflect the current state of the case law. For fraud or inequitable conduct most courts require "clear and convincing evidence" and an intent to withhold information, or gross negligence equivalent to intent.[5] The cases are not uniform on how material or relevant the information withheld must be. Paragraph (c)(1) adopts a "might reasonably be expected to affect" test. Paragraph (c), however, establishes only the minimum requirements that must be met for striking an application. It leaves the Office with discretion to require a higher degree of materiality (for example, a "but for" test) in appropriate circumstances.

Proposed § 1.346 explicitly requires a reasonable basis to support every assertion of improper conduct under § 1.56 made by a registered practitioner in any Office proceeding. The change in § 1.346 is not a change in substance but is only for emphasis. Concern has been expressed over the increasingly common practice of making "boiler plate" allegations of fraudulent procurement. Proposed § 1.346 gives specific notice that groundless charges of fraud or inequitable conduct may serve as a basis for disciplinary proceedings against registered practitioners under § 1.348.

OATHS AND DECLARATIONS

Proposed § 1.69 is intended to correct the anomalous situation in which foreign applicants are required to sign an oath or declaration in a language that they may not understand. It requires use of a language which is understood.

Proposed § 1.69(a) requires that persons must understand the content of documents to which foreign language oaths or declarations relate. The term "understands" provides flexibility for persons who cannot read the language in which the specification and claims are written to have the content explained to them.

Proposed § 1.69(b) anticipates that the Office will publish oaths and declaration forms in the languages of those countries from which a significant number of applications are received. An applicant who does not or is unable to use such a form, or any reproduction of such a form, must submit a verified English translation of the oath or declaration at the time it is filed. An exception is made for oaths or declarations under § 1.65, for which a verified English translation may be filed no later than two months after the filing date.

Proposed § 1.52 is changed to be consistent with the requirement of § 1.69 for foreign language oaths and declarations.

Proposed § 1.65(a)(1) requires inventors to acknowledge a duty to disclose information relevant to the patentability of their inventions. While the oath will not define the duty of disclosure fully, acknowledgement in general terms that such a duty exists will emphasize the importance of the duty to inventors who may not be familiar with the requirements of patent law and regulations. If this proposal is adopted the change in § 1.65 also would be incorporated in all appropriate sections in 37 CFR Part 3, "Forms for Patent Cases."

DECISIONS MADE PUBLIC

Proposed § 1.14(d) is intended to make more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public. The proposed rule includes reference to decisions of the Board of Patent Interferences as well as the decisions of the Board of Appeals and the Commissioner, which were previously covered.

It provides for public disiosure of the subject decisions whenever the applicant or party in interest fails to take the prescribed steps to prevent such disclosure after being given appropriate notice. It is applicable in the case of decisions that would have significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It places the burden on the Office to identify significant decisions. It is anticipated that no more than a few dozen decisions each year would be considered of sufficient importance for publication under the authority of this paragraph.

PROTESTS AND PUBLIC USE PROCEEDINGS

Proposed §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions as aids in avoiding the issuance of invalid patents.

Section 1.291(a) provides that protests will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by

[3] See S. 2255, 94th Congress, § 131(b)(1)(B).

[4] See e.g., In re Multi-District Litigation Involving Frost Patent, 398 F. Supp. 1353, 1369, 185 USPQ 729, 741 (D. Del. 1975); Kayton et al., Fraud in Patent Procurement: Genuine and Sham Charges, 43 Geo. Wash. L. Rev. 1, 40 (1974).

[5] E.g., Norton v. Curtiss, 433 F. 2d 779, 167 USPQ 532 (CCPA 1970).

the examiner, protests would have to be accompanied by copies of prior art documents relied upon, although protests without copies would not necessarily be ignored. This is similar to the requirement of proposed § 1.98 that copies of patents and publications accompany patentability statements. § 1.291 does not contemplate permitting a protester to participate in any further proceeding as a party. In the case of applications available to the public, such as reissue applications, the protester could file papers rebutting statements made by the applicant. The examiner at his discretion might request a protester to submit additional written information or might provide extra time for comments by a protester to be filed.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted.[6] The material submitted is not examined by the Office, but is available to members of the public inspecting Office records.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy.

In § 1.292 the requirement that petitioner offer to bear the Office's expenses in conducting the public use proceeding is deleted.

Proposed § 1.292 is also intended to ensure that the application file wrapper records the existence of public use proceedings. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to physically accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper itself is available.

PATENT APPEALS

Proposed § 1.194, first, makes clear that oral hearings should be requested only when the appellant considers a hearing necessary or desirable for a proper presentation of his appeal and, second, provides for oral arguments by examiners before the Board in certain appeals.

In most instances, well-written, fully developed arguments in the appellant's brief and the examiner's answer are the most effective way of arguing a case before the Board of Appeals. The legal and technological issues presented in appeals are, for the most part, best presented and understood using the precision of the written word. No adverse implications will be drawn as to the merits of the appeal from an applicant's waiving an oral hearing.

If an appellant considers an oral hearing necessary or desirable for a proper presentation of his appeal, an oral hearing will be scheduled upon request.

Proposed § 1.194(b) permits oral argument by, or on behalf of, the primary examiner whenever either the examiner or the Board believes it would be helpful. It incorporates the present practice of permitting examiners to present oral argument before the Board of Appeals (MPEP 1209). It gives the Board the additional discretionary authority to require examiners to present oral argument to ensure that all issues are fully and accurately presented.

It has been the Board's experience that effective oral argument, when needed, can be presented in less than the 30 minutes allowed in the present rule. Since March 20, 1975, it has been the Board's practice to limit oral argument to 20 minutes.[7] This practice is reflected in the proposed rules. Arguments by examiners would also be limited to a maximum of 20 minutes. It is anticipated that examiners often would utilize substantially less than 20 minutes since their role would be one of rebuttal and answering questions.

Proposed § 1.196(b) authorizes the Board of Appeals to reject allowed claims. The Board's lack of authority in the past has resulted in some anomalous situations. This proposal is not intended, however, as an instruction to the Board to reexamine every allowed claim in every appealed application. It is intended to give the Board authority to act when it becomes apparent during the Board's consideration of rejected claims that one or more allowed claims should also be rejected, on either the same or on different grounds than applied against the rejected claims.

[6] See notice of August 12, 1974, 926 O.G. 2.
[7] See notice of March 20, 1975, 933 O.G. 1010.

Although the statutory authority of the Board of Appeals to review "adverse decisions of examiners" (35 U.S.C. 7) has not been narrowly construed,[8] it has been held that since a general rule authorizing review of favorable decisions of the examiner has not been promulgated, the Board lacked such authority.[9]

The Commissioner can "prescribe as a rule of practice, generally applicable, that a favorable decision by a primary examiner may be reviewed, in the Commissioner's behalf, by some officer or by some board to which has been delegated the duty of making such review."[10] Proposed § 1.196(b) exercises the Commissioner's discretion to designate the Board of Appeals to review in their capacity as Examiners-in-Chief favorable decisions by the examiner in cases which are otherwise before it.

As proposed, § 1.196(b) would permit an applicant, at his option, to waive reconsideration by the examiner and by the Board of Appeals and treat the Board's rejection of allowed claims as the final decision of the Board. If the applicant elects to follow that course, the Board's rejection of allowed claims would be directly reviewable by the Court of Customs and Patent Appeals or the District Court for the District of Columbia.[11]

REASONS FOR ALLOWANCE

Proposed § 1.109 authorizes examiners to prepare a written record of the reasons for allowing claims in an application when they believe the reasons will not be apparent from other papers of record. In many cases the reasons for allowance will be evident from the examiner's rejections and the applicant's amendments and arguments overcoming the rejections. Moreover when the examiner's reason for allowance is merely that he can locate no relevant prior art, a statement of reasons probably will be meaningless.

On the other hand, courts and others occasionally have commented that statements of examiners' reasons for allowance would be useful in some circumstances.[12] When an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive, an explanation could be helpful to anyone later attempting to evaluate the patent. When an examiner withdraws a rejection for reasons not suggested by the applicant, an explanation could be useful.

Proposed § 1.109 gives the examiner discretion as to whether to prepare a statement of reasons for allowance. The last sentence of proposed § 1.109 permits the applicant to file a statement commenting on the reasons for allowance. Although the examiner would routinely consider the applicant's comments, his reasons would not ordinarily be amended. It is anticipated that the Patent and Trademark Office would prepare guidelines for examiners on administration of the rule. An experiment might be undertaken with a small number of applications before deciding whether to adopt a permanent rule.

PROPOSED RULES

The text of the proposed added and revised sections and paragraphs of sections is as follows (additions are indicated by arrows ; deletions are bracketed) :

§ 1.11 *Files open to the public.*

* * * * *

(b) ►All release applications and applications◄ [Applications] in which the Office has accepted a request filed under § 1.139 ►, and related papers in the application file,◄ are open to inspection by the general public, and copies may be furnished upon paying the fee therefor. ►The filing of reissue applications will be announced in the OFFICIAL GAZETTE.◄

§ 1.14 *Patent applications preserved in secrecy.*

* * * * *

(d) ►Any decision of the Board of Appeals or the Board of Patent Interferences, or any decision of the Commissioner

[8] In re Loehr, 500 F.2d 1390, 183 USPQ 56 (CCPA 1974) ; In re Haas, 486 F.2d 1053, 179 USPQ 623 (CCPA 1973) ; In re Hengehold, 58 CCPA 1099, 169 USPQ 473, 480 (1971) ; In re Searles, 164 USPQ 623 (CCPA 1970).
[9] Watson v. Bruns, 239 F.2d, 948, 111 USPQ 325 (D.C. Cir. 1956).
[10] Id.
[11] See In re Crowell, 17 CCPA 1009, 39 F.2d 681, 5 USPQ 84 (1930). See also In re Forstrom, 27 CCPA 1160, 111 F.2d 181, 45 USPQ 343 (1940), and In re Kirschbraun, 18 CCPA 735, 44 F.2d 675, 7 USPQ 132 (1930), for direct review of Board's decision on claims presented for the first time before the Board.
[12] E.g., Album Graphics, Inc. v. Ivy Hill Lithograph Corp., 378 F. Supp. 705, 709–10, 181 USPQ 321, 324–25 (S.D.N.Y. 1973).

on petition,◄ [Selected decisions of the Board of Appeals, or of the Commissioner, in abandoned applications] not otherwise open to public inspection ►(§ 1.11 and paragraphs (a) and (b) of this section) shall◄ [(paragraph (b) of this section) may] be published or made available for ►public inspection if: (1) The Commissioner believes the decision involves an interpretation of patent laws or regulations that would be of important precedent value; and (2) the applicant, or any party involved in the interference, does not, within one month after being notified of the intention to make the decision public, object in writing on the ground that the decision discloses a trade secret or other confidential information. If a decision discloses such information, the applicant or party shall identify the deletions in the text of the decision considered necessary to protect the information. If it is considered the entire decision must be withheld from the public to protect such information, the applicant or party must explain why. Applicants or parties will be given time to request reconsideration and seek court review before any portions of decisions are made public over their objection◄ [publication at the Commissioner's discretion, unless the applicant timely presents sufficient reasons for not doing so. The applicant will be notified, through the attorney of record in the application file, when it is proposed to release such a decision and a time not less than thirty days set for presenting any such reasons. The fact that the subject matter of the application has not been made public in any manner, or that the same subject matter is being prosecuted in a pending application, will be considered sufficient reason for not releasing the decision if the applicant so requests unless the text of the decision contains no description of such subject matter. Other reasons presented will be duly considered.] See § 2.27 for trademark applications.

§ 1.52 *Language, paper, writing, margins.*

(a) The specification and oath or declaration must be in the English language ►except as provided in § 1.69◄. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing or printing thereon to permit the production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

* * * * *

§ 1.56 ►*Duty of disclosure; striking of*◄ [*Improper*] *applications.*

►(a) A duty to disclose information to the Patent and Trademark Office rests on the inventor, each of the attorneys or agents who prepares or prosecutes the application, and every other individual who is involved in the preparation or prosecution of the application and who is associated with the inventor, the assignee or anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they believe to be relevant to the patentability of the claimed invention, i.e., information that might reasonably be expected to affect the decision of the examiner. The duty is commensurate with the degree of involvement in the preparation or prosecution of the application.◄

►(b)◄ Any application [signed or sworn to in blank, or without actual inspection by the applicant, and any application altered or partly filled in after being signed or sworn to, and also any application fraudulently filed or in connection with which any fraud is practiced or attempted on the Patent and Trademark Office.] may be stricken from the files ►if:

(1) Signed or sworn to in blank, or without actual inspection by the applicant;

(2) Altered or partly filled in after being signed or sworn to; or

(3) Any fraud or inequitable conduct is practiced or attempted on the Office in connection with it, including any violation of the duty of disclosure.◄

►(c) In order for an application to be stricken for failure to comply with the duty of disclosure, it must be established by clear and convincing evidence that:

(1) Information was withheld which might reasonably be expected to affect a decision of the Office on patentability; and

(2) The withholding was deliberate or grossly negligent.◄

§ 1.65 *Statement of applicant.*

(a)(1) The applicant, if the inventor, must state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his application. In every original application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to his application or patented or described in any printed publication in any country before his invention or more than one year prior to his application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in this country. ►He must acknowledge a duty to disclose information that he believes relevant to the patentability of the invention.◄ He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the application in this country.

(2) * * *

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►§ 1.69 *Foreign language oaths and declarations.*◄

►(a) Whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand and shall state that such individual understands the content of any documents to which the oath or declaration relates.◄

►(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under § 1.65, the translation may be filed in the Office no later than two months after the filing date.◄

►PATENTABILITY STATEMENT◄

§ 1.97 *Filing of patentability statement.*

►(a) At the time of filing the application or within two months thereafter, there shall be filed a patentability statement. The statement must be separate from the specification but may refer to matter contained in the specification.◄

►(b) The examiner will decline to examine any application in which the statement is defective or has not been filed. If a statement has been filed but is defective, the applicant will be given an opportunity to submit an amended statement. If no statement has been filed within two months after filing the application, the applicant may submit one later, provided the failure to file has been inadvertent and there is presented an adequate explanation of why it was not submitted earlier.◄

►(c) The statement shall not be construed as a representation that a search has been made or that no better art exists than that which has been considered. This section does not impose an obligation to make any search of patents, publications or other information outside the knowledge of the individuals who have a duty of disclosure under § 1.56.◄

►§ 1.98 *Content of patentability statement.*◄

►(a) The statement shall include: (1) A listing of the relevant patents, publications or other information, if any, considered by the applicant and/or any attorney or agent during preparation of the application; (2) a copy of at least the pertinent portion of each listed patent or publication; and (3) a concise explanation of the reasons why the claimed invention is believed patentable over the patents, publications or other information which applicant considers most relevant. If no such information was considered, the statement shall so

state. By "relevant" information is meant that which might reasonably be expected to affect the decision of the examiner.◄

►(b) When two or more patents or publications considered relevant are substantially identical, a copy of a representative one may be included in the statement and others merely listed. A translation of the pertinent portions of foreign language patents or publications considered relevant should be transmitted if an existing translation is readily available to the applicant.◄

►(c) Information cited or referred to by the examiner or applicant in a parent application must be included in the statement if considered relevant.◄

►§ 1.99 *Updating of patentability statement.*◄

►If an applicant, attorney or agent learns of additional relevant patents, publications or other information after filing the patentability statement and prior to issuance of a patent, the additional information shall be submitted to the examiner promptly, together with the explanation and copies required by § 1.98. This material may be incorporated into other papers or amendments being submitted to the examiner concurrently.◄

►§ 1.109 *Reasons for allowance.*◄

►If the examiner believes his reasons for allowing claims in an application will not be apparent from other papers of record, he may notify the applicant of the reasons for allowance. Such reasons may be incorporated into an Office action rejecting other claims of the application or may be the subject of a separate communication to the applicant. The applicant may file a statement commenting on the reasons for allowance within such time as may be specified by the examiner.◄

§ 1.175 *Reissue oath or declaration.*

(a) Applicants for reissue, in addition to complying with the requirements of the first sentence of § 1.65, must also file with their applications a statement under oath or declaration as follows:

(1) ►When the◄ [That] applicant verily believes the original patent to be wholly or partly inoperative or invalid, ►stating such belief◄ and the reasons why.

(2) When it is claimed that such patent is so inoperative or invalid "by reason of a defective specification or drawing," particularly specifying such defects.

(3) When it is claimed that such patent is inoperative or invalid "by reason of the patentee claiming more or less than he had a right to claim in the patent," distinctly specifying the excess or insufficiency in the claims.

►(4) When the applicant is aware of prior art or other information relevant to patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.◄

►(5)◄ [(4)] Particularly specifying the errors ►or what might be deemed to be errors◄ relied upon, and how they arose or occurred.

►(6) Stating that◄ [(5) That] said errors ►, if any,◄ arose "without any deceptive intention" on the part of the applicant.

* * * * *

§ 1.194►*Oral*◄ *Hearing.*

►(a) An oral hearing should be requested only in those circumstances in which the appellant considers such a hearing necessary or desirable for a proper presentation of his appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Appeals as appeals decided after oral hearing.◄

►(b) If appellant requests an oral hearing, an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.◄

►(c)◄ If no request for oral hearing has been made by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing, a day of hearing will be set, and due notice thereof given to the appellant. Hearing will be held as stated in the notice, and oral argument will be limited to [one-half hour] ►twenty minutes each for the appellant and for the primary examiner◄ unless otherwise ordered before the hearing begins.

§ 1.196 *Decision by the Board of Appeals.*

* * * * *

(b) ►Although the Board of Appeals normally will confine its decision to a review of rejections made by the primary examiner, should it◄ [Should the Board of Appeals] have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, ►or knowledge of any grounds for rejecting any allowed claim,◄ it may include in its decision a statement to that effect with its reasons for so holding, which statement shall constitute a rejection of the claims. The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the primary examiner. The statement shall be binding upon the primary examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the primary examiner, avoids the additional ground for rejection stated in the decision. The applicant may waive such reconsideration before the primary examiner and have the case reconsidered by the Board of Appeals upon the same record before them. Where request for such reconsideration is made the Board of Appeals shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The applicant may waive reconsideration by the Board of Appeals and treat the decision, including the added grounds for rejection given by the Board of Appeals, as a final decision in the case.

* * * * *

§ 1.291 *Protests ►and prior art citations by public◄ [to the grant of a patent.]*

►(a)◄ The patent statutes do not ►prohibit◄ [provide for] opposition to the grant of a patent on the part of the public. [Protests to the grant of a patent are ordinarily merely acknowledged, and filed after being referred to the examiner having charge of the subject matter involved for his information.] ►A protest to the grant of a patent specifically identifying the application to which the protest is directed will be entered in the application file, and if timely submitted and accompanied by a copy of any prior art documents relied upon will be considered by the examiner.◄

►(b) Citations of prior art may be entered in the patent file after a patent has been granted, at the request of a member of the public or the patentee. Such citations will be entered without comment by the Patent and Trademark Office.◄

►(c) Protests and prior art citations by the public, and any accompanying papers or exhibits, should either (1) reflect that a copy of the same has been served upon the applicant or patentee or his attorney or agent of record; or (2) be filed in duplicate in the event service is not possible.◄

§ 1.292 *Public use proceedings.*

* * * * *

(b) The petition and accompanying papers should [be filed in duplicate, or served upon the applicant, his attorney or agent of record, and petitioner should offer to bear any expense to which the Office may be put in connection with the proceeding] ►either (1) reflect that a copy of the same has been served upon the applicant, his attorney or agent of record; or (2) be filed in duplicate in the event service is not possible. The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file.◄

§ 1.346 *Signature and certificate of attorney.*

Every paper filed by an attorney or agent representing an applicant or party to a proceeding in the Patent and Trademark Office must bear the signature of such attorney or agent, except papers which are required to be signed by the applicant or party in person (such as the application itself and affidavits or declarations required of applicants). The signature of an attorney or agent to a paper filed by him, or the filing or presentation of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief, there is good ground to support it ►(including

good ground to support any assertion of improper conduct under § 1.56)◄; and that it is not interposed for delay.

Dated: September 17, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: September 28, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.76-28916; Filed 10-1-76; 8:45 am]

[951 O.G. 1343]

(Pending—No Final Action Taken)

APPEALS

(49) HEARINGS BEFORE THE BOARD OF APPEALS

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been sucessful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of 1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to *twenty minutes* unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Mar. 20, 1975.

[933 O.G. 1010]

(50) REPLY BRIEFS

Applicants should clearly and specifically indicate in their reply briefs the new points of argument "raised in the examiner's answer" to which said reply briefs are directed. Rule 193(b) does not permit general rebuttal of each statement made in the examiner's answer; Consequently a reply brief which is not restricted to answering "new points" may be refused consideration in toto.

EDWIN L. REYNOLDS,
Apr. 15, 1969. *First Assistant Commissioner.*

[862 O.G. 343]

(51) APPEALS—CONFIDENTIAL MEMORANDA

The practice of presenting confidential memoranda to the Board of Appeals is hereby terminated. All correspondence with the Board of Appeals, whether by the Examiner or the applicant will be on the record. No unpublished decisions which are unavailable to the general public by reason of 35 U.S.C. 122 will be cited by the Examiner or the applicant except that either the Examiner or the applicant has the right to cite an unpublished decision in an application having common ownership with the application on appeal.

WILLIAM E. SCHUYLER, JR.,
July 28, 1970. *Commissioner of Patents.*

[877 O.G. 733]

(52) EXAMINER TESTIMONY

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works* v. *Joy Manufacturing Co.*, 167 USPQ 170, 171: " . . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the procedure set forth in Section 7.02, Department of Commerce Administrative Order 205-12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appropriate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (a) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (b) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court

or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. 762]

INTERFERENCES

(53) INTERFERENCE PRACTICE

Listing of Attorneys or Agents in Final Decisions

A recent inquiry was made at the Board of Patent Interferences relating to the listing of attorneys' names in the heading of the final decisions of the Board of Patent Interferences.

Since this is a matter that may be of interest to those who prosecute interferences in the United States Patent and Trademark Office, the present practice of the Board of Patent Interferences is set forth below.

The heading of final decisions of the Board of Patent Interferences separately lists the names of all attorneys, agents or firms recognized as representing a party in the interference. Since firms have not been recognized by the Office since July 2, 1971, the listing of firm names is limited to firms of record in applications filed prior to July 2, 1971, and in unexecuted continuations or divisions thereof (Rule 60).

The names of the attorneys, agents or firms are taken from the interference file wrapper. The noted file wrapper lists the attorney or agent or firm of record in the applications or patent involved in the interference. Additionally, the name of any attorney presenting a party's oral argument at the final hearing is separately listed.

If a party desires to correct a firm name or exclude an attorney or agent previously of record from the above-noted decision, steps should be taken *promptly* to correct the files involved in the interference. This should be done by proceeding pursuant to the provisions of Rule 36, or by taking such other action as the party deems appropriate.

WALTER A. MODANCE,
May 6, 1975. *Chairman, Board of Patent Interferences.*

[935 O.G. 3]

(54) INTERFERENCE PRACTICE

Settlement Agreements

Inquiries by attorneys have been made from time to time at the Board of Patent Interferences as to why the Commissioner does not give notice to the parties or their attorneys of record, a reasonable time prior to termination of an interference, of the requirement relative to the filing of settlement agreements, citing 35 USC 135(c), second paragraph.

Attention is called to the fact that notice is given in the second full paragraph of Form POL–76, the letter to the parties advising them of the declaration of the interference.

WALTER A. MODANCE,
Oct. 15, 1975. *Chairman, Board of Patent Interferences.*

[940 O.G. 570]

(55) ACCESSIBILITY OF NON-FINAL DISCOVERY OPINIONS AND ORDERS ISSUED BY THE BOARD OF PATENT INTERFERENCES

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. § 1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. § 552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. § 122 and 37 C.F.R. § 1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. § 1.287]
- 1.10 Requests and service under § 1.287(a)
- 1.20 Requests under § 1.287(b)
- 1.30 Motions for additional discovery under § 1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under § 1.287(d)(1)
- 1.50 Action under § 1.287(d)(2)
- 1.60 Agreements under § 1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976. *Commissioner of Patents and Trademarks.*

[944 O.G. 2098]

(56) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

Revision of Rules in Interference Practice

On February 19, 1976, notice of proposed rulemaking regarding the revision of §§ 1.228, 1.243, 1.244, 1.254, and 1.256 of Title 37, Code of Federal Regulations, was published in the Federal Register (41 FR 7513). Interested persons were asked to comment and a period extending from the date of publication of the proposed rule changes to March 26, 1976 was allocated for such purposes. Five comments were received. The comments and a summary of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. All but one of the comments were favorable to the proposed changes. In view of the one adverse comment received, the proposal to amend § 1.254 is not being adopted. Section 1.228 was amended as proposed to provide a time for oral arguments at the hearing set under the provisions of said section and §§ 1.243 and 1.244 were rearranged without changing the wording therein. Finally, § 1.256 was amended to amplify the procedure therein.

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Part 1 of Title 37, Code of Federal Regulations is hereby amended as follows:

§ 1.228 *Summary Judgment.*

When an interference is declared on the basis of a showing under § 1.204(c), such showing will be examined by an Examiner of Interferences. If the Examiner considers that the facts set out in the showing provide sufficient basis for the interference to proceed, the interference will proceed in the normal manner as provided by the regulations in this part; otherwise an order shall be entered concurrently with

the notice of interference pointing out wherein the showing is insufficient and notifying the applicant making such showing that summary judgment will be rendered against him because of such insufficiency at the expiration of a period specified in the notice, not less than 30 days, unless cause be shown why such action should not be taken. In the absence of a showing of good and sufficient cause, judgment shall be so rendered. Any response made during the specified period will be considered by a Board of Patent Interferences without an oral hearing unless such hearing is requested by the applicant, but additional affidavits, declarations or exhibits will not be considered unless accompanied by a showing in excuse of their omission from the original showing. If the applicant files a response to the order to show cause, the patentee will be furnished with one copy of the showing under § 1.204(c) and will be allowed not less than 30 days from its mailing date within which to present his views with respect thereto. He shall also be entitled to be represented at any oral hearing on the matter. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than 30 minutes for each party. The Board will determine, on the basis of the original showing and the response made, whether the interference should be allowed to proceed or summary judgment should be entered against the junior applicant.

§ 1.243 *Motions before the Board of Patent Interferences*

(a) Motions relating to matters other than those specified in § 1.231 will be determined by a patent interference examiner or the Board of Patent Interferences, as may be deemed appropriate. Such motions shall be made in writing and shall contain a full statement of the action sought and the grounds therefor, and satisfactory proof of any facts required must accompany the motion. Oral hearings will not be held except on order of a patent interference examiner or Board of Patent Interferences. Briefs or memoranda in support of such motions shall accompany the motion. Any opposition to the motion, together with any brief or memorandum in support thereof, shall be filed within 20 days from the date of service of the motion unless some other date is set by the patent interferences examiner.

(b) Typewritten briefs may be used in connection with all motions. By stipulation of the parties subject to approval or by order of the tribunal before whom the motion is pending, briefs may be received if filed otherwise than as prescribed.

(c) In oral hearings on motions, the moving parties shall have the right to make the opening and closing arguments. Unless otherwise ordered before the hearing begins, oral arguments will be limited to 30 minutes for each party.

(d) Any request for reconsideration or modification of a decision or other action by the Board of Patent Interferences or patent interference examiner must be filed within 20 days after the date of the decision or other action and any reply thereto must be filed within 20 days from the date of service of the request. With regard to requests for reconsideration of a decision after final hearing, see § 1.256(b).

§ 1.244 *Petition to the Commissioner from decisions on motions.*

There is no appeal from decisions rendered on motions, but the Commissioner may consider on petition any matter involving abuse of discretion or the exercise of his supervisory authority, or such other matters as he may deem proper to consider. Any such petition must comply with § 1.181 and, if not filed within 20 days from the decision complained of, may be dismissed as untimely. Any opposition thereto must be filed within 20 days from the date of service of the petition.

§ 1.254 *Briefs at final hearing.*

Briefs at final hearing before the Board of Patent Interferences shall be submitted in printed form, except that when not in excess of 50 legal-size double-spaced typewritten pages, or the equivalent thereof, and in any other case where satisfactory reason therefor is shown they may be submitted in type written form. If submitted in printed form, they shall be the same in size and the same as to page and print as is specified for printed copies of testimony. Typewritten briefs shall conform to the requirements for typewritten copies of testimony, except that legal-size paper may be used and the binding and covers specified are not required. Every brief of more than 15 pages shall contain a subject index with page references, supplemented by a list of all authorities referred to, together with references to pages thereof. Three copies of each brief must be filed. The times for filing briefs will be set at an appropriate stage in the proceeding prior to final hearing. The brief for the junior party shall present a full, fair statement of the questions involved, including his position with respect to priority evidence presented on behalf of other parties, and a clear statement of the points of law or fact on which he relies. The main brief for each party shall contain a copy of the counts in interference.

§ 1.256. *Final hearing.*

(a) Final hearings will be held by the Board of Patent Interferences on the day appointed at the designated time. If either party appears at the proper time, he will be heard. After the day of hearing, the case will not be taken up for oral argument except by consent of all parties. If the Board of Patent Interferences be prevented from hearing the case at the time specified, a new assignment will be made, or the case will be continued from day to day until heard. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than one hour for each party. A junior party may reserve a portion of his time for rebuttal purposes, but a full, fair opening of his case must be made, including his position with respect to the case presented on behalf of other parties. After a contested case has been argued nothing further relating thereto will be heard unless upon request of the Board of Patent Interferences

(b) Any request for rehearing or reconsideration, or modification of the decision after final hearing, must be filed within 30 days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Interferences so states. Any reply thereto must be filed within 15 days from the filing of the request. The times specified herein may be extended by the Board of Patent Interferences upon a showing of sufficient cause. (See § 1.304).

Effective date: These amendments shall become effective on August 31, 1976.

Dated: June 23, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76-19526; Filed 7-6-76; 8:45 am]

[949 O.G. 3]

MISCELLANEOUS

(57) DISCLOSURE DOCUMENT PROGRAM

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program.

Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

THE PROGRAM

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception

of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

CONTENT OF DISCLOSURE DOCUMENT

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8½ by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

RETENTION

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

WARNING AS TO LIMITATIONS

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Jan. 4, 1971. *Assistant Commissioner of Patents.*

[883 O.G. 3]

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(58) NOTICE TO OFFICIAL GAZETTE SUBSCRIBERS

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

In case of complete stoppage, please send a copy of your order or expiration notice, together with proof of payment (copy of cancelled check or processed order), to Mr. S. J. Bania, Director, Office of Publications (Room 2–5C26), Patent and Trademark Office, Washington, D.C. 20231, Attention: Shirley A. Hammel (Telephone 703/557–3794), or Lillie M. Harrison (Telephone 703/557–1985).

This notice is effective with the publication date and supersedes the notice published on this subject in 934 O.G. 886, dated April 25, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Sept. 12, 1975.

[939 O.G. 3]

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(59) POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557–3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766–2386.

ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265–4597.

ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.

BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.

BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.

BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.

BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842–3208.

CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343–6181, Ext. 375.

CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778–2151.

CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353–4450.

CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (513) 684–2944.

CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522–4750.

COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765–5345.

DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749–1515.

DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837–3246.

DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284–4222.

DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.

GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275–9111, Ext. 345.

HARTFORD, CONN. 06103, Room 610–B, Federal Office Bldg., 450 Main St. (203) 244–3530.

HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.

HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.

INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269–6214.

KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374–3142.

LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824–7591.

MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534–3213.

MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350–5267.

MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224–3473.

MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725–2133.

NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.

NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.

NEWARK, N.J., 07102, Gateway Bldg., (4th floor) (201) 645–6214.

PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597–2850.

PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261–3285.

PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644–2850.

PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221–3001.

RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784–5203.

RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782–2246.

ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.

SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524–5116.

SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556–5860.

SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723–4640.

SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.

SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442–5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

[937 O.G. 386]

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(60) PATENT COOPERATION TREATY: IMPLEMENTING LEGISLATION AND RATIFICATION

Public Law 94–131, as reprinted below, implements the Patent Cooperation Treaty (see Official Gazette, Volume 876, page 341; July 14, 1970) which was signed by the United States and 34 other countries in 1970. After enactment of the implementing legislation on November 14, 1975, the United States ratified the Treaty on November 26, 1975, thereby becoming the first country with major patent activity to do so. In accordance with the provisions of Article 63 of the Treaty, it enters into force three months after eight countries have adhered to it, four of which must have certain defined major patent activity.

Up to the time of United States ratification eight countries with only minor patent activity had adhered to the Treaty. Ratification by the United States, therefore, represents a significant step in the direction of bringing the Treaty into force. Other countries with major patent activity, and especially European countries, have been awaiting United States ratification before adhering themselves. Consequently, it is hoped that United States commitment to the Treaty has been demonstrated and will encourage adherence by other countries with major patent activity, thereby bringing into force a Treaty which would offer many advantages and benefits to patent applicants and patent offices alike. Because of the necessary action of other countries in bringing the Treaty into force, no exact date can be given at this time. It is

presently estimated, however, that at least the necessary number of countries would be reached in Fiscal Year 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Dec. 11, 1975.

Public Law 94-131
94th Congress, S. 24
November 14, 1975

An Act

To carry into effect certain provisions of the Patent Cooperation Treaty, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35, United States Code, entitled "Patents", be amended by adding at the end thereof a new part IV to read as follows:

Patent Cooperation Treaty.

"PART IV.—PATENT COOPERATION TREATY

"Chapter 35.—DEFINITIONS

"Sec.
"351. Definitions.

"§ 351. Definitions

35 USC 351.

"When used in this part unless the context otherwise indicates—

"(a) The term 'treaty' means the Patent Cooperation Treaty done at Washington, on June 19, 1970, excluding chapter II thereof.

"(b) The term 'Regulations', when capitalized, means the Regulations under the treaty excluding part C thereof, done at Washington on the same date as the treaty. The term 'regulations', when not capitalized, means the regulations established by the Commissioner under this title.

"(c) The term 'international application' means an application filed under the treaty.

"(d) The term 'international application originating in the United States' means an international application filed in the Patent Office when it is acting as a Receiving Office under the treaty, irrespective of whether or not the United States has been designated in that international application.

"(e) The term 'international application designating the United States' means an international application specifying the United States as a country in which a patent is sought, regardless where such international application is filed.

"(f) The term 'Receiving Office' means a national patent office or intergovernmental organization which receives and processes international applications as prescribed by the treaty and the Regulations.

"(g) The term 'International Searching Authority' means a national patent office or intergovernmental organization as appointed under the treaty which processes international applications as prescribed by the treaty and the Regulations.

"(h) The term 'International Bureau' means the international intergovernmental organization which is recognized as the coordinating body under the treaty and the Regulations.

"(i) Terms and expressions not defined in this part are to be taken in the sense indicated by the treaty and the Regulations.

"Chapter 36.—INTERNATIONAL STAGE

"Sec.
"361. Receiving Office.
"362. International Searching Authority.
"363. International application designating the United States: Effect.
"364. International stage: Procedure.
"365. Right of priority; benefit of the filing date of a prior application.
"366. Withdrawn international application.
"367. Actions of other authorities: Review.
"368. Secrecy of certain inventions; filing international applications in foreign countries.

35 USC 361.

"§ 361. Receiving Office

"(a) The Patent Office shall act as a Receiving Office for international applications filed by nationals or residents of the United States. In accordance with any agreement made between the United States and another country, the Patent Office may also act as a Receiving Office for international applications filed by residents or nationals of such country who are entitled to file international applications.

"(b) The Patent Office shall perform all acts connected with the discharge of duties required of a Receiving Office, including the collection of international fees and their transmittal to the International Bureau.

"(c) International applications filed in the Patent Office shall be in the English language.

"(d) The basic fee portion of the international fee, and the transmittal and search fees prescribed under section 376(a) of this part, shall be paid on filing of an international application. Payment of designation fees may be made on filing and shall be made not later than one year from the priority date of the international application.

Post, p. 690.

35 USC 362.

"§ 362. International Searching Authority

"The Patent Office may act as an International Searching Authority with respect to international applications in accordance with the terms and conditions of an agreement which may be concluded with the International Bureau.

35 USC 363.

"§ 363. International application designating the United States: Effect

"An international application designating the United States shall have the effect, from its international filing date under article 11 of the treaty, of a national application for patent regularly filed in the Patent Office except as otherwise provided in section 102(e) of this title.

Post, p. 691.

35 USC 364.

"§ 364. International stage: Procedure

"(a) International applications shall be processed by the Patent Office when acting as a Receiving Office or International Searching Authority, or both, in accordance with the applicable provisions of the treaty, the Regulations, and this title.

"(b) An applicant's failure to act within prescribed time limits in connection with requirements pertaining to a pending international application may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the treaty and the Regulations, and provided the conditions imposed by the treaty and the Regulations regarding the excuse of such failure to act are complied with.

35 USC 365.

"§ 365. Right of priority; benefit of the filing date of a prior application

"(a) In accordance with the conditions and requirements of section 119 of this title, a national application shall be entitled to the right of

35 USC 119.

priority based on a prior filed international application which designated at least one country other than the United States.

"(b) In accordance with the conditions and requirement of the first paragraph of section 119 of this title and the treaty and the Regulations, an international application designating the United States shall be entitled to the right of priority based on a prior foreign application, or a prior international application designating at least one country other than the United States. 35 USC 119.

"(c) In accordance with the conditions and requirements of section 120 of this title, an international application designating the United States shall be entitled to the benefit of the filing date of a prior national application or a prior international application designating the United States, and a national application shall be entitled to the benefit of the filing date of a prior international application designating the United States. If any claim for the benefit of an earlier filing date is based on a prior international application which designated but did not originate in the United States, the Commissioner may require the filing in the Patent Office of a certified copy of such application together with a translation thereof into the English language, if it was filed in another language. Post, p. 692.

"§ 366. Withdrawn international application 35 USC 366.

"Subject to section 367 of this part, if an international application designating the United States is withdrawn or considered withdrawn, either generally or as to the United States, under the conditions of the treaty and the Regulations, before the applicant has complied with the applicable requirements prescribed by section 371(c) of this part, the designation of the United States shall have no effect and shall be considered as not having been made. However, such international application may serve as the basis for a claim of priority under section 365 (a) and (b) of this part, if it designated a country other than the United States. Infra.

"§ 367. Actions of other authorities: Review 35 USC 367.

"(a) Where a Receiving Office other than the Patent Office has refused to accord an international filing date to an international application designating the United States or where it has held such application to be withdrawn either generally or as to the United States, the applicant may request review of the matter by the Commissioner, on compliance with the requirements of and within the time limits specified by the treaty and the Regulations. Such review may result in a determination that such application be considered as pending in the national stage.

"(b) The review under subsection (a) of this section, subject to the same requirements and conditions, may also be requested in those instances where an international application designating the United States is considered withdrawn due to a finding by the International Bureau under article 12(3) of the treaty.

"§ 368. Secrecy of certain inventions; filing international applications in foreign countries 35 USC 368.

"(a) International applications filed in the Patent Office shall be subject to the provisions of chapter 17 of this title. 35 USC 181 et seq.

"(b) In accordance with article 27(8) of the treaty, the filing of an international application in a country other than the United States on the invention made in this country shall be considered to constitute the filing of an application in a foreign country within the meaning of chapter 17 of this title, whether or not the United States is designated in that international application.

"(c) If a license to file in a foreign country is refused or if an international application is ordered to be kept secret and a permit refused, the Patent Office when acting as a Receiving Office or International Searching Authority, or both, may not disclose the contents of such application to anyone not authorized to receive such disclosure.

"Chapter 37.—NATIONAL STAGE

"Sec.
"371. National stage: Commencement.
"372. National stage: Requirements and procedure.
"373. Improper applicant.
"374. Publication of international application: Effect.
"375. Patent issued on international application: Effect.
"376. Fees.

35 USC 371.

"§ 371. National stage: Commencement

"(a) Receipt from the International Bureau of copies of international applications with amendments to the claims, if any, and international search reports is required in the case of all international applications designating the United States, except those filed in the Patent Office.

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22 (1) or (2) of the treaty, at which time the applicant shall have complied with the applicable requirements specified in subsection (c) of this section.

"(c) The applicant shall file in the Patent Office—

"(1) the national fee prescribed under section 376(a)(4) of this part;

"(2) a copy of the international application, unless not required under subsection (a) of this section or already received from the International Bureau, and a verified translation into the English language of the international application, if it was filed in another language;

"(3) amendments, if any, to the claims in the international application, made under article 19 of the treaty, unless such amendments have been communicated to the Patent Office by the International Bureau, and a translation into the English language if such amendments were made in another language;

35 USC 111 et seq. 35 USC 115.

"(4) an oath or declaration of the inventor (or other person authorized under chapter 11 of this title) complying with the requirements of section 115 of this title and with regulations prescribed for oaths or declarations of applicants.

"(d) Failure to comply with any of the requirements of subsection (c) of this section, within the time limit provided by article 22 (1) or (2) of the treaty shall result in abandonment of the international application.

"(e) After an international application has entered the national stage, no patent may be granted or refused thereon before the expiration of the applicable time limit under article 28 of the treaty, except with the express consent of the applicant. The applicant may present amendments to the specification, claims, and drawings of the application after the national stage has commenced.

"(f) At the express request of the applicant, the national stage of processing may be commenced at any time at which the application is in order for such purpose and the applicable requirements of subsection (c) of this section have been complied with.

"§ 372. National stage: Requirements and procedure 35 USC 372.

"(a) All questions of substance and, within the scope of the requirements of the treaty and Regulations, procedure in an international application designating the United States shall be determined as in the case of national applications regularly filed in the Patent Office.

"(b) In case of international applications designating but not originating in, the United States—

"(1) the Commissioner may cause to be reexamined questions relating to form and contents of the application in accordance with the requirements of the treaty and the Regulations;

"(2) the Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations. 35 USC 121.

"(c) Any claim not searched in the international stage in view of a holding, found to be justified by the Commissioner upon review, that the international application did not comply with the requirement for unity of invention under the treaty and the Regulations, shall be considered canceled, unless payment of a special fee is made by the applicant. Such special fee shall be paid with respect to each claim not searched in the international stage and shall be submitted not later than one month after a notice was sent to the applicant informing him that the said holding was deemed to be justified. The payment of the special fee shall not prevent the Commissioner from requiring that the international application be restricted to one of the inventions claimed therein under section 121 of this title, and within the scope of the requirements of the treaty and the Regulations.

"§ 373. Improper applicant 35 USC 373.

"An international application designating the United States, shall not be accepted by the Patent Office for the national stage if it was filed by anyone not qualified under chapter 11 of this title to be an applicant for the purpose of filing a national application in the United States. Such international applications shall not serve as the basis for the benefit of an earlier filing date under section 120 of this title in a subsequently filed application, but may serve as the basis for a claim of the right of priority under section 119 of this title, if the United States was not the sole country designated in such international application. 35 USC 111 et seq. Post, p. 692. 35 USC 119.

"§ 374. Publication of international application: Effect 35 USC 374.

"The publication under the treaty of an international application shall confer no rights and shall have no effect under this title other than that of a printed publication.

"§ 375. Patent issued on international application: Effect 35 USC 375.

"(a) A patent may be issued by the Commissioner based on an international application designating the United States, in accordance with the provisions of this title. Subject to section 102(e) of this title, such patent shall have the force and effect of a patent issued on a national application filed under the provisions of chapter 11 of this title. Post, p. 691.

"(b) Where due to an incorrect translation the scope of a patent granted on an international application designating the United States, which was not originally filed in the English language, exceeds the scope of the international application in its original language, a court of competent jurisdiction may retroactively limit the scope of the patent, by declaring it unenforceable to the extent that it exceeds the scope of the international application in its original language.

35 USC 376. **"§ 376. Fees**

"(a) The required payment of the international fee, which amount is specified in the Regulations, shall be paid in United States currency. The Patent Office may also charge the following fees:

"(1) A transmittal fee (see section 361(d));

"(2) A search fee (see section 361(d));

"(3) A supplemental search fee (to be paid when required);

"(4) A national fee (see section 371(c));

"(5) A special fee (to be paid when required; see section 372(c));

"(6) Such other fees as established by the Commissioner.

"(b) The amounts of fees specified in subsection (a) of this section, except the international fee, shall be prescribed by the Commissioner. He may refund any sum paid by mistake or in excess of the fees so specified, or if required under the treaty and the Regulations. The Commissioner may also refund any part of the search fee, where he determines such refund to be warranted.".

SEC. 2. Section 6 of title 35, United States Code, is amended by adding a paragraph (d) to read as follows:

35 USC 6. **"§ 6. Duties of Commissioner**

* * * * * * *

"(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.".

SEC. 3. Item 1 of section 41(a) of title 35, United States Code, is amended to read as follows:

35 USC 41. **"§ 41. Patent fees**

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design cases, $65; in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.".

Post, p. 691.

SEC. 4. Section 42 of title 35, United States Code, is amended to read as follows:

35 USC 42. **"§ 42. Payment of patent fees; return of excess amounts**

"All patent fees shall be paid to the Commissioner who, except as provided in sections 361(b) and 376(b) of this title, shall deposit the same in the Treasury of the United States in such manner as the Secretary of the Treasury directs, and the Commissioner may refund any sum paid by mistake or in excess of the fee required by law.".

Ante, p. 686, Supra.

SEC. 5. Paragraph (e) of section 102 of title 35, United States Code, is amended to read as follows:

"§ 102. Conditions for patentability; novelty and loss of right to patent 35 USC 102.

* * * * * * *

"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or".

SEC. 6. The first sentence of section 104 of title 35, United State Code, is amended to read as follows:

"§ 104. Invention made abroad 35 USC 104.

"In proceedings in the Patent Office and in the courts, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country, except as provided in sections 119 and 365 of this title.". 35 USC 119.

SEC. 7. The second sentence of the second paragraph of section 112 of title 35, United States Code, is amended to read as follows: Ante, p. 686.

"§ 112. Specification 35 USC 112.

* * * * * * *

"A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

"Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

"A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.".

SEC. 8. Section 113 of title 35, United States Code, is amended to read as follows:

"§ 113. Drawings 35 USC 113.

"The applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented. When the nature of such subject matter admits of illustration by a drawing and the applicant has not furnished such a drawing, the Commissioner may require its submission within a time period of not less than two months from the sending of a notice thereof. Drawings submitted after the filing date of the application may not be used (i) to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or (ii) to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.".

SEC. 9. Section 120 of title 35, United States Code, is amended to read as follows:

35 USC 120.

"§ 120. Benefit of earlier filing date in the United States

"An application for patent for an invention disclosed in the manner
35 USC 112. provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section
Ante, p. 686. 363 of this title, by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.".

SEC. 10. The first paragraph of section 282 of title 35, United States Code, is amended to read as follows:

35 USC 282.

"§ 282. Presumption of validity; defenses

"A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.".

Effective dates. 35 USC 351 note.

SEC. 11. (a) Section 1 of this Act shall come into force on the same day as the entry into force of the Patent Cooperation Treaty with respect to the United States. It shall apply to international and national applications filed on and after this effective date, even though entitled to the benefit of an earlier filing date, and to patents issued on such applications.

(b) Sections 2 to 10 of this Act shall take effect on the same day as section 1 of this Act and shall apply to all applications for patent actually filed in the United States on and after this effective date, as well as to international applications where applicable.

(c) Applications for patent on file in the Patent Office on the effective date of this Act, and patents issued on such applications, shall be governed by the provisions of title 35, United States Code, in effect immediately prior to the effective date of this Act.

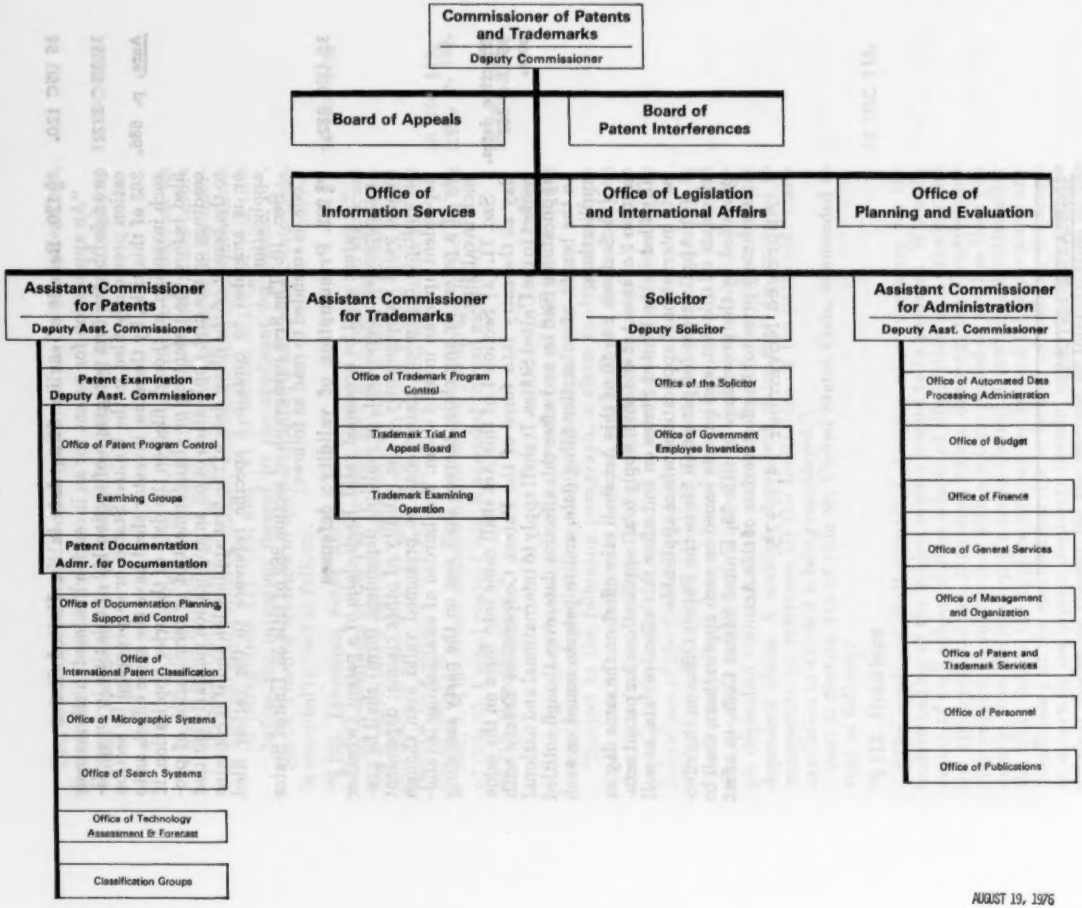
Approved November 14, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 94-592 (Comm. on the Judiciary).
SENATE REPORT No. 94-215 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 121 (1975):
June 21, considered and passed Senate.
Nov. 3, considered and passed House.

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

Attachment to DOO 30-3B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AUGUST 19, 1976

(62)

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Head, Ruth Mason ---------- 3283

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TRADEMARK SECTION

The following is a compilation of the more important notices and rule changes concerning trademarks which have been published in the OFFICIAL GAZETTE *of the Patent and Trademark Office from July 1, 1964 through December 31, 1976. Inclusion of older notices published prior to July 1, 1964 is not believed to be useful, nor are any notices or changes included which have been rescinded or whose substance has now been incorporated in the trademark rules or in the Trademark Manual of Examining Procedure.*

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(300) INTERVIEWS INVOLVING TRADEMARK APPLICATION

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

HORACE B. FAY, JR.,
July 6, 1964. *Assistant Commissioner.*

This supersedes the notice of February 10, 1958, 728 O.G. (TM 1).

[804 O.G. TM 147 (July 28, 1964)]

(301) CHANGE IN FORMAT FOR PUBLISHING TRADEMARKS FOR OPPOSITION

Section 30 of the Trademark Act of 1946 as amended by Public Law 772, 87th Congress, approved October 9, 1962, 76 Stat. 769, provides for the filing of a combined application for the registration of a trademark in more than one class.

The present practice of publishing the mark with pertinent data under each class in which registration is sought results in needless duplication.

Beginning with the issue of November 3, 1964, "Marks Published for Opposition" will be divided into two sections. In Section 1, all marks presented in combined applications for registration in more than one class will be published with only one reproduction of each mark.

The reproduction of the mark will be followed by the class numbers and titles, and under each class will appear the description of the goods in connection with which the trademark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

Trademarks presented in applications for registration in a single class will be published, as in the past, in class order, in Section 2.

The same procedure will be followed in the notice of the issuance of registrations on the Supplemental Register.

EDWIN L. REYNOLDS,
Sept. 18, 1964. *First Assistant Commissioner.*

[807 O.G. TM 51 (Oct. 13, 1964)]

(302) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Allowance of Application

The following amendment is made, to take effect on publication in the Federal Register. Notice and public procedure and deferment of the time of taking effect are deemed unnecessary in view of the nature of the amendment, which is procedural only.

The purpose of the change is to eliminate the procedural step of signing a trademark application file prior to allowance, which has been found to be burdensome and which is unnecessary since the allowance of the application, subject to possible inter partes proceedings, has already been approved by an Examiner having full signatory authority.

Section 2.82 is amended by striking out the clause "the Examiner will sign the application file to indicate allowance and," so that the section as amended will read as follows:

§ 2.82 *Allowance of application.*

If no opposition is filed within the time permitted (§§ 2.101 and 2.102), or if filed and dismissed, and if no interference is declared, or concurrent use proceeding instituted, the application will be prepared for issuance of the certificate of registration as provided in § 2.151.

(Sec. 1, 66 Stat. 793, 35 U.S.C. 6; 60 Stat. 427, 15 U.S.C. 1057)

Dated: Mar. 23, 1966.

EDWARD J. BRENNER,
Commissioner of Patents.

Approved:

J. HERBERT HOLLOMAN,
Assistant Secretary for Science and Technology.

Published in 31 F.R. 5554; Apr. 8, 1966

[826 O.G. TM 61 (May 10, 1966)]

(303) PUBLICATION OF MATERIAL IN "NOTICES" SECTIONS OF PATENTS AND TRADEMARKS OFFICIAL GAZETTE

Effective Jan. 3, 1967, publication of material in the Patent and Trademark "Notices" sections of the OFFICIAL GAZETTE will occur only once.
Dec. 1, 1966.

[833 O.G. TM 108 (Dec. 20, 1966)]

(304) POWERS OF ATTORNEY IN REGISTERED TRADEMARK FILES

On and after February 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

C. M. WENDT,
Jan. 30, 1967. *Director.*

[835 O.G. TM 95 (Feb. 21, 1967)]

(305) CHARGES AGAINST DEPOSIT ACCOUNTS UNDER SPECIAL CONDITIONS

The practice as to deposit accounts is hereby extended to include charges against deposit accounts under special conditions. Charges under this practice shall not exceed $50 for each trademark application, registration or opposition.

The Director and the Assistant to the Director of the Trademark Examining Operation are authorized to make a charge against a deposit account provided prior approval, as by telephone, is obtained from the applicant, registrant, attorney or agent. This practice is limited to ex parte appeals to the Trademark Trial and Appeal Board, oppositions, affidavits under the provisions of Section 8, and applications for renewal and may be exercised only in emergency situations, such as where a party is unable to file the fee within the statutory period.

When such a charge is made, prior approval will be indicated in the file by identification of the name of the authorizing party, the date and the type of authorization, the purpose for which the charge is made, and the deposit account number.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

[879 O.G. TM 151 (Oct. 27, 1970)]

(306) SEPARATION OF THE PATENT AND TRADEMARK SECTIONS OF THE OFFICIAL GAZETTE

Effective February 2, 1971, the OFFICIAL GAZETTE will be separated into two parts to be known as the *Patent Official Gazette and the Trademark Official Gazette.*

* * * * *

Orders for subscriptions should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Also effective February 2, 1971, the OFFICIAL GAZETTE will no longer contain "Decisions in Patent and Trademark Cases." Decisions of the type heretofore found in the "Decisions in Patent and Trademark Cases" are published by non-Federal organizations such as, for example, the Bureau of National Affairs, Inc., 1231 25th St. NW., Washington, D.C. 20037, and West Publishing Co., 50 Kellogg Blvd., St. Paul, Minn. 55102.

Finally, the "Decisions Leaflet" of the OFFICIAL GAZETTE will no longer be supplied as a separate subscription item after January 26, 1971. According to present plans, however, both the PATENT OFFICIAL GAZETTE and the TRADEMARK OFFICIAL GAZETTE will have identical "Patent Office Notices" sections containing notices of the various types heretofore published in the Gazette decision leaflet and Trademark Section. Those notices of particular interest to Patent Office employees will be accumulated and published approximately every fourth week, and distributed separately to employees.

WILLIAM E. SCHUYLER, JR.,
Dec. 29, 1970. *Commissioner of Patents.*

[882 O.G. TM 33 (Jan. 12, 1971)]

(307) PREFACE TO THE TRADEMARK O.G. NOTICES

In September 1970, a Public Advisory Committee for Trademark Affairs was established by the Secretary of Commerce. The Purpose of this Committee was to advise the Patent Office on ways to increase the efficiency and effectiveness of the administration of the Trademark Act. A report of this Advisory Committee has been received by the Commissioner of Patents. After reviewing the recommendations, although the review is not complete, it has been decided to make certain changes in trademark practice and procedure, and to propose changes in the rules of practice. Beginning with this issue of the OFFICIAL GAZETTE and in subsequent issues as needed, announcements will be published concerning changes in procedures and proposed amendments to the Trademark Rules of Practice.

* * * * *

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 2 (Aug. 3, 1971)]

(308) REQUEST FOR EXTENSION OF TIME IN WHICH TO OPPOSE

The Patent Office is adopting a new procedure to be used when filing a request for an extension of time in which to oppose under Section 13 of the Trademark Act and Rule 2.102, Trademark Rules of Practice. All requests for extension of time should be submitted in triplicate. The Patent Office will stamp each copy of the request with the action taken and send a copy to the requester and the applicant. The third copy will be entered in the file.

The purpose of this new procedure is to expedite the handling of extensions of time by eliminating the preparation of a formal notice of the disposition of the request. Further, this procedure will provide the applicant with additional information concerning the potential opposition.

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 3 (Aug. 3, 1971)]

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(309) RECORDING OF DOCUMENTS AFFECTING TITLE

The Patent Office is liberalizing its policy concerning the recording of documents, other than assignments, which affect title to trademark registrations and applications. Under Rule 2.185 of the Trademark Rules of Practice, instruments affecting title to a trademark registration or application, and licenses of trademarks which are the subject of trademark registrations or applications, will be recorded even though the recording thereof may not serve as constructive notice under Section 10 of the Trademark Act of 1946, as amended (15 U.S.C. 1060).

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13231; July 16, 1971

[889 O.G. TM 2 (Aug. 3, 1971)]

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(310) TRADEMARK EXAMINING PROCEDURE FOR AMENDED APPLICATIONS; REPORTING OLDEST DATES OF AMENDED TRADEMARK APPLICATIONS

Effective immediately, the order in which amendments to trademark applications are examined is changed. Previously, Examiners have usually acted on amended cases in order of filing date of the application which the amendment concerned, i.e., amended cases with the oldest filing date were examined first. Under the new procedure, amended cases will normally be examined in the order in which the amendment or other response is received, i.e., amendments that are received first will normally be examined first.

Effective with this issue of the OFFICIAL GAZETTE (Trademark Section) in order to reflect more accurately the condition of division dockets, the column reporting the date of the oldest amended application in each division has been changed to indicate the date of receipt of the oldest filed amendment. Under this new method of reporting the oldest date of receipt of a filed amendment upon which no action has been taken by an Examiner will be indicated for each division of the Trademark Examining Operation.

RENE D. TEGTMEYER,
July 15, 1971. *Assistant Commissioner.*

[889 O.G. TM 6 (Aug. 3, 1971)]

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(311) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER 1—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Recognition of Attorneys and Agents, Standards of Conduct, and Patent Application Petitions

These rules changes eliminate present provision for the recognition and registration of firms of attorneys and agents for practice in patent and trademark cases, and permit registered attorneys and agents to file papers in patent applications without the need for filing powers of attorney or authorizations. The changes further establish the Code of Professional Responsibility of the American Bar Association as the standard of conduct for those practicing before the Patent Office insofar as the Code is not inconsistent with Patent Office rules. Other changes eliminate the present requirement for a petition or other express request for a patent and liberalize requirements as to inventor names.

The changes relating to the discontinuance of the recognition and registration of firms are intended to obviate problems incident to such registration such as, for example, the lack of certainty as to the responsibility of individual attorneys and agents for actions taken by registered nonpartnership business entities, such as professional corporations, the problems associated with the rights to firm names and registration numbers upon dissolution or reorganization of firms, and the recognition as "firms" of groups of attorneys or agents, such as parts of corporation organizations, when the attorneys and agents are not in fact associated as partners. Acceptance of papers filed in patent applications by registered attorneys and agents upon a representation that the attorney or agent is authorized to act in a representative capacity is for the purpose of facilitating responses on behalf of applicants in patent applications, and, further, to obviate the need for filing powers of attorney or authorizations of agent in individual applications when there has been a change in composition of law firms or corporate patent staffs. Interviews with a registered attorney or agent not of record will, in view of 35 U.S.C. section 122, be conducted only on the basis of information and files supplied by the attorney or agent.

Provision is made for an applicant to supply an address to receive correspondence from the Patent Office concerning his application, in addition to his residence address, so that the Patent Office may direct mail to any address of applicant's selection, such as a corporate patent department, a firm of attorneys or agents, or an individual attorney, agent, or other person. In connection with patent applications pending upon the effective date of the changes in which a firm is the only representative of record (and in connection with divisions and continuations thereof not requiring execution by the applicant), the address of the firm will be considered to be the correspondence address for the application. Powers of attorney and authorizations of agent in favor of registered individual attorneys and agents will, of course, continue to be recognized and accepted.

The amendments to §§ 1.344 and 2.13 are intended to provide a more definite and uniform standard of conduct for those engaged in practice before the Patent Office than do present rules. The Code of Professional Responsibility of the American Bar Association is incorporated by reference in the rule with a statement as to where copies thereof may be inspected or obtained. The rule specifies that the standards referred to are those set forth in the Code of Professional Responsibility as amended February 24, 1970, and the rule does not, therefore, refer to standards imposed by later amendments of the Code. Any standards in other Patent Office rules which are inconsistent with standards imposed by the Code (as, for example, the limitations in § 1.345(b) on the distribution of professional announcements and the duties imposed by § 1.205(b)) remain in force.

The elimination of the requirement for a petition requesting the grant of a patent and the relaxation of requirements as to the names of applicants are intended to simplify patent application procedures. Section 1.76 is being revoked as redundant in view of revisions in § 1.57.

Notice of proposed rule making regarding revocation of §§ 1.35 and 1.61 and revision of §§ 1.14, 1.21, 1.33, 1.34, 1.36, 1.51, 1.52, 1.57, 1.76, 1.341, 1.343, 1.344, 1.346, 1.347, 2.13, and 2.15 of Title 37, Code of Federal Regulations was published in the Federal Register of Janutry 15, 1971 (36 F.R. 611). Interested persons were given an opportunity to participate in the rulemaking process through submission of comments in writing and at an oral hearing held on March 23, 1971. The rules are being adopted after full and careful consideration of all the material submitted. The departures from the published text reflect certain of the views expressed in the submitted material.

Effective date. This revision shall become effective on the date of its publication in the Federal Register (7-2-71).

In consideration of the comments received and pursuant to the authority contained in Section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), and Section 31 of that Act (66 Stat. 795; 35 U.S.C. 31), Title 37 of the Code of Federal Regulations is hereby amended as follows:

* * * * *

18. Section 2.13 is revised to read as follows:

§ 2.13 *Professional conduct.*

Attorneys and other persons appearing before the Patent Office in trademark cases must conform to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association as amended February 24, 1970, insofar as such code is not inconsistent with this part. A copy of the said code is available for inspection in the Office of the Solicitor, U.S. Patent Office, Room 11C04, Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Va. Copies of the code are available upon request to the American Bar Center, 1155 East 60th Street, Chicago, Ill. 60637.

19. Section 2.15 is revised to read as follows:

§ 2.15 *Signature and certificate of attorney or agent.*

Every paper filed by an attorney at law or other person representing an applicant or party to a proceeding in the Patent Office must bear the signature of such attorney at law or other person except those papers which are required to be signed by the applicant or party. The signature of an attorney at law or such other person to a paper filed by him, or the filing of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief there is good ground to support it; and that it is not interposed for delay.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Approved:
JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 36 F.R. 12616; July 2, 1971

[890 O.G. TM 60 (Sept. 14, 1971)]

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(312) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Access to Pending Applications

A proposal was published at 36 F.R. 16194 to amend § 2.27 by deleting the requirement to show good cause in order to obtain access to a pending application file.

After consideration of all comments and suggestions submitted by interested persons, the amendment as proposed is hereby adopted, subject to the following changes:

1. The title of § 2.27 is changed by inserting the word "trademark" after the word "pending."

2. In paragraph (b) of § 2.27 the word "trademark" after the word "pending" is deleted.

Access to a pending application will be granted upon oral request at the office of the Director of the Trademark Examining Operation. The files will be ordered at 2 p.m. each day and will usually be available for inspection by 3 p.m. the same day. Files must be inspected in the presence of office personnel and papers may not be removed without authorization. Copies of the contents of files may be made only in the Trademark Search Room or by the Document Service Branch. Written requests for copies of the contents of application files may be addressed to the Document Service Branch; the cost is 30 cents per page.

The procedure for access to published and registered files and terminated inter partes proceedings will remain unchanged. Access to a published application is granted by request in the Trademark Docket Section. In order to obtain access to a registered file or terminated inter partes proceeding, an order must be placed in the Trademark Docket Section. These files are available either the same day or the morning of the following day.

Effective date. This amendment is effective on the date of its publication in the Federal Register (12–31–71).

ROBERT GOTTSCHALK,
Acting Commissioner of Patents.

Dec. 21, 1971.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.
December 22, 1971.

* * * * *

Published in F.R. 24506, Dec. 31, 1971

[895 O.G. TM 2 (Feb. 1, 1972)]

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(313) INITIAL PROCESSING OF APPLICATIONS

On February 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective February 1, 1972.

RICHARD A. WAHL,
Jan. 11, 1972. *Acting Commissioner of Patents.*

Approved:

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 37 FR 948; Jan. 21, 1972

[895 O.G. TM 193 (Feb. 22, 1972)]

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(314) TRADEMARK OFFICE ACTIONS

Effective Apr. 1, 1972, trademark applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

ROBERT GOTTSCHALK,
Feb. 7, 1972. *Commissioner of Patents.*

[895 O.G. TM 238 (Feb. 29, 1972)]

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(315) PETITION TO MAKE TRADEMARK APPLICATIONS SPECIAL

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lowry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Date: Mar. 13, 1972.

[897 O.G. TM 2 (Apr. 4, 1972)]

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(316) BULKY SPECIMENS IN TRADEMARK AND SERVICE MARK APPLICATIONS

Many of the applications which are being received in the Trademark Application Section contain specimens which are too bulky to be placed inside the application file. The handling and storing of these bulky specimens is taking more time and space than can be justified. The trademark rules do not provide for filing bulky specimens, and applicants and attorneys are requested to adhere to the precise provisions of the rules.

Trademark Rule 2.56 requires that specimens be of a material suitable for being placed in a file, be capable of being arranged flat (preferably not more than one inch in thickness), and not be larger than 8½ x 13 inches. If specimens of this character cannot be furnished, Trademark Rule 2.57 provides that facsimiles in the nature of photographs or similar reproductions be filed. Facsimiles must not be larger than 8½ x 13 inches and should clearly and legibly show the mark and all matter used in connection therewith.

In order to reduce the quantity of bulky specimens and to avoid the possibility of delay in examination due to bulky specimens, the following procedure has been adopted:

When specimens cannot be fitted into the file, the Trademark Application Section forwards the specimens to the Examiner separate from the file and attaches to the file two copies of a form which is a pre-examination memorandum pointing out that the bulky specimens are not acceptable and that proper specimens should be filed promptly. Upon receipt of the file and the forms, the Examiner mails one copy of the form to the applicant, or applicant's attorney if there be one, and places the other copy in the file. The Examiner will then destroy four of the bulky specimens, retaining one until proper specimens or facsimiles are received. Failure to furnish proper specimens as requested in the memorandum may delay the process of examination of the application.

ROBERT GOTTSCHALK,
June 16, 1972. *Commissioner of Patents.*

[900 O.G. TM 176 (July 25, 1972)]

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(317) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Abandonment of Application

A proposal was published at 37 FR 18391 to revise § 2.68. Full consideration has been given to all comments received pursuant to this notice and changes in the text of the original proposal have been made in view thereof.

The revision of § 2.68 permits an attorney or other person representing the applicant to abandon or withdraw an application. Prior to this revision, the applicant was required to sign the statement of abandonment. The rule is further revised by the addition of a sentence which indicates that in a Patent Office proceeding, abandonment of the application does not affect any rights which the applicant may have in the mark. The word "withdrawal" which has been added to the rule is synonymous with the word "abandonment" in the context of this rule and may be used by those who prefer to do so.

Effective date. This revision shall become effective on March 27, 1973.

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Published in 38 F.R. 7985; Mar. 27, 1973

[909 O.G. TM 254 (Apr. 24, 1973)]

(318) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE

PARTS 2 AND 6—RULES OF PRACTICE IN TRADEMARK CASES

International Trademark Classification

A proposal was published at 37 F.R. 6404 to revise § 6.1 of the Rules of Practice in Trademark Cases. The Patent Office proposed to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957, as revised at Stockholm on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks. Pursuant to the Notice, written comments have been received, and a public hearing was held on June 14, 1972. Full consideration has been given to all matter presented, and changes in the text of the original proposal have been made in view thereof. It has been determined that adoption of the international classification system is desirable.

The Patent Office has studied the international classification and, since Mar. 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals as a subsidiary classification. Based on this experience and the comments received, it is now believed that adoption of the international schedule as the primary classification system is desirable. The international system is easier to administer because of fewer classes of goods and the availability of an alphabetical listing of goods and services.

The Nice Agreement provides for an International Committee of Experts whose objective is to keep the classification current. The classification of specific goods and services is set forth in the Alphabetical List entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). In addition, the International Trademark Classification List contains the names of the classes setting forth the basic contents of each class. The Alphabetical List also comprises explanatory notes which serve as guidelines for determining the appropriate international class for a specific product or service.

The alphabetical listing within the International Trademark Classification Manual is currently used by the Office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 36 F.R. 13232; July 16, 1971.

Applications for registrations filed on or after Sept. 1, 1973, and registrations issuing thereon, will be classified according to the international classification set forth in the new § 6.1. Accordingly, the international classification is adopted under Section 30 of the Trademark Act for all purposes under the statute and rules; and, therefore, will be the criterion for determining, inter alia, fees.

Applications for the registration of marks filed on or before Aug. 31, 1973, appeals or petitions to revive or oppositions filed in connection with said applications, and affidavits, renewals and petitions for cancellation filed in connection with registrations issuing thereon, will continue to be processed under the classification system existing at the time the mark was registered.

All applications which are published and registrations which are issued will carry both the appropriate international classification and existing U.S. classification number.

An insufficient fee, in connection with an appeal or opposition on any application or in connection with an affidavit or renewal filed in connection with any registration, will not render the same unacceptable, if the proper fee is submitted within a time limit set forth in a notification of the defect, providing the proper fee for at least one class has been originally submitted within the applicable time limit. This will be the case even if the full fee is not received within the sixth year in the case of an affidavit filed under Section 8 or before the end of the twentieth year, including the grace period, in the case of renewal applications, or within the six-month statutory response period in the case of an appeal, or within the thirty-day opposition period, or any extension thereof in the case of the filing of an opposition.

The existing classification system will continue to be used for searching registered and pending marks until all documents in the search file are organized on the basis of the international system of classification. Until this changeover is effected, the U.S. class designation will continue to be printed on all published applications and registrations issued under the existing or the international classification system to facilitate searching on the basis of the existing U.S. system of classification.

Until all applications filed on or before Aug. 31, 1973, have been disposed of, the trademark sections of the OFFICIAL GAZETTE, which are organized by class, will include two sections: one for applications published or registrations issued on the basis of applications filed on or before Aug. 31, 1973, organized by class according to the U.S. schedule of classes; the other section for applications published or registrations issued on the basis of applications filed on or after Sept. 1, 1973, organized by class according to the new international schedule.

Certification marks and collective membership marks will continue to be classified as set forth in redesignated §§ 6.3 and 6.4.

Efforts will be made to have the International Trademark Classification List printed by the Government Printing Office or otherwise assure the availability of the List from local sources. Notification will appear in the OFFICIAL GAZETTE when the List is available from local sources or the Government Printing Office.

The English edition of the "International Classification of Goods and Services to Which Trademarks Are Applied" can presently be ordered from:

Sales Branch, The Patent Office, Block C
Station Square House, St. Mary Cray
Orpington, Kent, England

Certain modifications and additions to the international trademark classification have been published as supplements and are also available from the British Office. In addition, and inasmuch as the World Intellectual Property Organization (WIPO) has issued the List in several languages, it is anticipated that an English version will be published by that organization.

We have been advised by the Patent Office of the United Kingdom that the only acceptable methods of payment for the International Trademark Classification List are by International Postal Money Order or by banker's draft payable in sterling and drawn on a bank in the United Kingdom.

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Date: May 14, 1973.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 38 F.R. 14681, June 4, 1973

[911 O.G. TM 210 (June 26, 1973]

(NOTE: Rule 2.85 (Classification schedules) was revised and Rule 6.1 (International schedule of classes of goods and services) was established as of September 1, 1973 by this notice; prior U.S. schedule of classes was redesignated as Rule 6.2.)

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(319) TRADEMARK REGISTRATION TREATY

At the conclusion of the Vienna Diplomatic Conference on industrial property, the Trademark Registration Treaty was signed on June 12, 1973 for the United States. This Treaty is designed to simplify the procedures for obtaining international registration of trademarks for United States companies doing business abroad.

The Treaty was unanimously adopted at the final plenary session. In addition to the United States, the United Kingdom, the Federal Republic of Germany, Italy, Portugal, Hungary, San Marino and Monaco also signed. Some forty-six countries were represented at the Conference. In their closing statements most of the other delegations present indicated their hope to sign before the end of the year. The Treaty remains open for signature through December 31, 1973. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession.

The negotiations at Vienna represent the climax of the work of several committees of experts and working groups which have met at Geneva since 1970 with the assistance of the World Intellectual Property Organization (WIPO). The U.S. delegation to the Vienna Conference was composed of officials from the Department of State, the U.S.

Patent Office and advisors from the private sector. Previous versions of the proposed Treaty were published on February 22, 1972; September 19, 1972; and February 20, 1973; in the OFFICIAL GAZETTE of the U.S. Patent Office. Published in this issue is the complete text of the Trademark Registration Treaty and its Regulations, as adopted by the Conference. For convenience, in addition to the text of the Articles and Regulations as adopted there is included a table of contents at the end of each section.

Additional copies of this material are available upon request to the Commissioner of Patents.

ROBERT GOTTSCHALK,
June 22, 1973 *Commissioner of Patents.*

[912 O.G. TM 205 (July 24, 1973)]

(320) FORM PARAGRAPHS AND PRINTED FORMS IN TRADEMARK CASES

In September of 1971, the Trademark Examining Operation began utilizing form paragraphs for the purpose of accelerating the preparation and typing of first action Office letters and to increase the uniformity in the application of the Trademark Statute and the Rules by Trademark Examiners.

The form paragraphs presently total 136 and cover those objections and grounds for refusal which are commonly relied upon by Trademark Examiners in first Office actions. In some cases, the paragraphs contain blanks to be filled in by the Examiner. In addition, the Examiner may add additional sentences to the paragraphs.

The form paragraphs have been placed on magentic tapes mounted on automatic typewriters. Where the use of a form paragraph is appropriate, the Examiner identifies the paragraph to be typed by a preassigned number which is used by the typist to effect the automatic typing of the paragraph.

The Examiner may add any additional paragraphs to the letter which are not covered by an appropriate form paragraph, in which case the typist merely manually adds the paragraph to the letter.

The form paragraphs are amended from time to time to incorporate improvements in the wording as the need for such becomes apparent. Also, new paragraphs are added and old paragraphs eliminated, as experience dictates the need.

In addition, the Office has adopted a printed first action form with check-off boxes to indicate to the applicant the appropriate objection or ground of refusal in first Office actions. This form is used only where it can be used appropriately as a complete first Office action. It is not used in any case to supplement a first Office action incorporating paragraphs not encompassed by the form action. It has been found that the form action is appropriate for use in approximately 15–20% of the first actions going out of the Office.

The form first action is also designed for use as a notice of the publication of an application for opposition.

Copies of the text of the form paragraphs used with the automatic typewriters and copies of the first action form may be obtained by addressing a request for the same to the "Commissioner of Patents, Washington, D.C. 20231."

Date: June 29, 1973.

RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

[912 O.G. TM 310 (July 31, 1973)]

(321) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER 1—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Lawful Use for Supplemental Register and Size of Facsimiles

The Patent Office is revising §§ 2.47 and 2.57 of the trademark rules of practice. Section 2.47 is being revised to set forth that the year's use which is the basis for registration on the Supplemental Register must be lawful use. Existing § 2.47 states that the year's use for the Supplemental Register must be "continuous use," whereas section 23 of the Trademark Act of 1946 specifies that such use must be "lawful use." The purpose of this revision is to conform the wording of § 2.47 to the wording of the statute. This revision does not effect any change in practice, as in applying the rule the term "continuous use" has been treated as having the same meaning as the term "lawful use" in the statute.

Section 2.57 is being revised to set forth that facsimile-specimens are not to exceed 8½ inches wide and 13 inches long. Existing § 2.57 states that facsimiles shall be not larger than specified for the drawing. That statement is now incorrect due to a recent amendment of the drawing length to 11 inches. The purpose of this revision is to correct the wording of §2.57, and to conform the wording of rule 2.57 to the wording of § 2.56 (Specimens) which has already been amended to specify that specimens are not to exceed 8½ inches wide and 13 inches long.

Since these revisions impose no burden on any person, notice and public procedures thereon are deemed unnecessary.

Therefore, pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123), and section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6, as amended October 5, 1971, 85 Stat. 364), Part 2 of Chapter I of Title 37 of the Code of Federal Regulations is hereby revised as follows:

1. Section 2.47 is revised to read as follows:

§ 2.47 *Supplemental register.*

In an application to register on the Supplemental Register, the application shall so indicate and shall specify that the mark has been in lawful use in commerce, specifying the nature of such commerce, by the applicant for the preceding year, if the application is based on such use. When an applicant requests registration without a full year's use of the mark, in accordance with the last paragraph of section 23 of the act, the showing required must be separate from the application.

(Sec. 23, 60 Stat. 435; 15 U.S.C. 1091)

2. Section 2.57 is revised to read as follows:

§ 2.57 *Facsimiles.*

When, due to the mode of applying or affixing the trademark to the goods, or to the manner of using the mark on the goods, or to the nature of the mark, specimens as above stated cannot be furnished, five copies of a suitable photograph or other acceptable reproduction, not to exceed 8½ inches wide and 13 inches long, and clearly and legibly showing the mark and all matter used in connection therewith, shall be furnished.

Effective date. These revisions shall become effective on July 16, 1973.

Dated: July 5, 1973.

RENE D. TEGTMEYER,
Acting Commissioner of Patents.

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 38 F.R. 18876; July 16, 1973

[913 O.G. TM 2 (Aug. 7, 1973)]

(322) CHANGES IN FORMAT FOR PUBLISHING TRADEMARKS FOR OPPOSITION

Because of the adoption of the International classification of goods and services by the United States as of September 1, 1973 (see OFFICIAL GAZETTE of June 26, 1973, 911 O.G. TM 210), it is necessary to change the arrangement in the OFFICIAL GAZETTE of the marks published for opposition.

Beginning with the issue of May 7, 1974, the section of the OFFICIAL GAZETTE entitled "Marks Published for Opposition" will be divided into four sections instead of the present two sections. (For the preceding change from one to two sections, see OFFICIAL GAZETTE of October 13, 1964, 807 O.G. TM 51.) Sections 1 and 2 will be according to international classification and will contain marks in applications filed on or after September 1, 1973, and Sections 3 and 4 will be according to prior United States classification and will contain marks in applications filed on or before August 31, 1973.

In Section 1, all marks presented in combined applications filed on or after September 1, 1973 for registration in more than one international class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the international class numbers, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all

classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In Section 2, all marks presented in applications filed on or after September 1, 1973 for registration in a single class will be published in international class order.

In Section 3, all marks presented in combined applications filed on or before August 31, 1973 for registration in more than one prior United States class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the prior United States class numbers and titles, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In section 4, all marks presented in applications filed on or before August 31, 1973 for registration in a single class will be published in the prior United States class order.

The following explanation will appear under the heading "Marks Published for Opposition":

> The following marks are published in compliance with section 12(a) of the Trademark Act of 1946. Applications for the registration of marks in more than one class have been filed as provided in section 30 of said act as amended by Public Law 772, 87th Congress, approved Oct. 9, 1962, 76 Stat. 769. Opposition under Section 13 may be filed within thirty days of the date of this publication. See Rules 2.101 to 2.105.
>
> A separate fee of twenty-five dollars for opposing each mark in each class must accompany the opposition.

Sections 1 through 4 will appear immediately after the above explanation, the sections being designated as follows:

Section 1. International classification—Application in more than one class
Section 2. International classification—Application in one class
Section 3. Prior United States classification—Application in more than one class
Section 4. Prior United States classification—Application in one class

The same procedure of dividing into four sections will be followed in the notice of the issuance of registrations on the Supplemental Register.

RENE D. TEGTMEYER,
Mar. 22, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 122 (Apr. 16, 1974)]

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(323) WORDING IN VERIFICATION OR DECLARATION OF TRADEMARK APPLICATION

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely, when applied to the goods of such other person, to cause confusion, or cause mistake, or to deceive:*—

The wording emphasized conforms to the present language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance, Examiners will not require new verifications or declarations. When the obsolete wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

RENE D. TEGTMEYER,
Mar. 25, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 186 (Apr. 23, 1974)]

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(324) MAIL DELAYS AND PETITIONS TO REVIVE (TRADEMARKS)

Since applications that become abandoned unintentionally present burdens to both the Patent Office and the applicant, a simplified procedure has been devised to alleviate these burdens when the abandonment results from a delay in the mails. This procedure (which is similar to the procedure adopted for patent applications at 910 O.G. 402 and 910 O.G. TM 76) provides for an automatic petition to revive.

When a trademark communication which falls within the circumstances enumerated below is mailed to the Patent Office more than three full days prior to the due date, a conditional petition may be attached to the communication. If the communication is received in the Patent Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee, and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his attorney stating that the communication and petition were either placed in the United States mail as first class or air mail or placed in the mail outside the United States as air mail. Since mail handled in this manner may reasonably be expected to reach the Patent Office by the due date, any mail delays beyond such time will be considered to constitute unavoidable delay and sufficient cause to grant a petition to revive (Section 12(b) of the Trademark Act of 1946).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action which places the application in condition for publication or issue.
3. A notice of appeal and requisite fee.
4. An appeal brief.

A suggested declaration form for the petition is shown below:

Applicant:
Serial No.: Petition to Revive
Date Filed:
Mark:

I hereby declare that the attached communication is being deposited in ( ) the United States mail as first class or air mail, or ( ) the mail outside the United States as air mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on _____, which date is more than three full days prior to the due date, at _____ (Location), by _____ (Name of individual)

In the event that such communication is not timely filed in the Patent Office, it is requested that this paper be treated as a petition to revive and that the delay in prosecution be held unavoidable.

The petition fee is authorized to be charged to Deposit Account No. _____ in the name of _____.

The undersigned declares further that all statements made herein of his own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

Date: (Signature of applicant or applicant's attorney)

And

Date: (Signature of person mailing, if other than the above)

Normal petition practices are not affected in those situations where this procedure is either not elected or not appropriate, nor does this procedure bar the granting of a petition in different fact situations where justified.

RENE D. TEGTMEYER,
Mar. 21, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 126 (Apr. 23, 1974)]

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(325) SIGNATURE TO AMENDMENT TO SUPPLEMENTAL REGISTER

Heretofore, in amending a trademark application from the Principal Register to the Supplemental Register and there had not been a full year of use prior to the date the application was filed, the statement in the amendment, to the effect that the mark had been in use for a year, was required to be signed by the applicant.

Effective with this notice, the amendment may hereafter be made by the attorney, and the signature of the applicant normally will not be required merely because some of the year of use necessary for registration on the Supplemental Register occurred after the application was originally filed on the Principal Register. If the Examiner has basis for believing that there is some reason for further inquiry or signature by applicant, the Examiner may of course take appropriate action.

The filing date which will be effective for an application so amended will be the date the amendment is filed, as the application when originally filed was not sufficient for registration on the Supplemental Register. Trademark Rule 2.75.

RENE D. TEGTMEYER,
Apr. 4, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 250 (Apr. 30, 1974)]

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(326) TRADEMARK APPLICATIONS UNDER SECTION 44 WITHOUT SPECIMENS AND USE

A significant number of applications are being filed under Section 44 of the Trademark Act of 1946 without specimens and without a statement of use, on the basis of the decision in *John Lecroy & Son, Inc.* v. *Langis Foods Limited,* 177 USPQ 717 (TT&A Bd. 1973), so that it appears desirable to provide the public with information as to the manner in which the Patent Office is handling such applications. This procedure has been incorporated into the Trademark Manual of Examining Procedure. However, since the Manual is not yet ready for distribution, this notice is being published at this time.

The memorandum which is being sent with the filing receipt to each applicant who falls within the above circumstances explains the procedure and reads as follows:

U.S. Department of Commerce

PATENT OFFICE

Trademark Application Filed Under Section 44 of the Act of 1946;

(No Allegation of Use and No Specimens)

MEMORANDUM TO ACCOMPANY FILING RECEIPT

The decision in *John Lecroy & Son, Inc.* v. *Langis Foods Limited,* 177 USPQ 717, rendered by the Trademark Trial and Appeal Board on May 7, 1973, appears to indicate that use and specimens should no longer be requisites for applications under Sections 44(d) and 44(e) of the Trademark Act. That decision has, however, been appealed to the United States District Court for the District of Columbia.

In view of the civil action filed in this case, use and specimens as requirements for such applications are not being eliminated. The Office is therefore assigning to the above-identified application a filing date which is conditional upon the ultimate decision in the above case of *Lecroy* v. *Langis,* and is mailing a filing receipt. However, this application will not be forwarded for examination until the decision in the case becomes final. A copy of the drawing will be placed in the search room with the following stamped thereon: "Withheld from Examination—Sec. 44."

The applicant has the following alternatives:

If applicant files specimens and a statement that the mark is in use (such statement being verified or in the form of a declaration under Rule 2.20), the application will be forwarded for examination with a filing date of the date of receipt of the specimens.

If a statement of use and specimens are not filed, the application will be withheld from examination until termination of the appeal of the above decision. If the decision is affirmed, the application will be forwarded for examination. If the decision is reversed, the application will become an informal application and the papers will be returned.

C. M. WENDT,
Mar. 22, 1974. *Director, Trademark Examining Operation.*

RENE D. TEGTMEYER,
Apr. 4, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 250 (Apr. 30, 1974)]

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(327)

TITLE 37

Patents, Trademarks, and Copyrights

CHAPTER I

PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 1

RULES OF PRACTICE IN PATENT CASES

PART 2

RULES OF PRACTICE IN TRADEMARK CASES

Addition of Metric (S.I.) Equivalents

The Commissioner of Patents is revising §§ 1.84, 1.253, 2.31, 2.52, 2.56 and 2.57 of the rules of practice to set forth and encourage use of the metric system of measurements in papers submitted to the Patent Office. These changes provide dual dimensions in both the patent and trademark rules of practice.

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[922 O.G. TM IX, X, XI, XII (May 14, 1974)]

(328) TRADEMARK REGISTRATION TREATY

Trademark Act of 1946

The text of the Trademark Registration Treaty (TRT), signed on June 12, 1973, was reproduced in the OFFICIAL GAZETTE of July 24, 1973 and three post-conference documents were published in the OFFICIAL GAZETTE of March 12, 1974. The questions of United States ratification and of the legislation which would be necessary for its implementation in the United States are now under study in the Patent Office. Interested persons and organizations have been requested to submit their views on these questions to the Patent Office prior to September 1, 1974.

Reproduced below is an outline of the changes in the Trademark Act of 1946 which might be required, or desirable, if the TRT is ratified and implemented. This outline is intended as a guideline to possible legislation designed to implement the requirements of the Treaty and to provide equivalent benefits to national applicants.

In regard to a few of the provisions, alternatives have been indicated. Where this is done, the order of their presentation herein does not necessarily indicate any order of preference.

This material, as well as that previously published, is made available in order to assist interested persons in their own studies of the question of ratification by the United States and implementing legislation rather than constituting a position of the Patent Office on these questions.

C. MARSHALL DANN,
Apr. 29, 1974. *Commissioner of Patents.*

OUTLINE

Introduction

This paper is an outline of possible changes in the Trademark Act of 1946 (60 Stat. 427; 15 U.S.C. 1051 et seq.), as amended, which may be required or desirable if the Trademark Registration Treaty, signed by the United States and thirteen other countries as of December 31, 1973, is ratified and implemented.

The subject is dealt with in two parts. Part I outlines changes in the domestic trademark statute which would be applicable in the case of national applications to register marks in the United States Patent Office. Part II concerns additional provisions which would be necessary in order to assimilate the proposed Treaty to this national law.

For convenience, reference is made, following some of the sections, to the article of the Treaty which requires or gives rise to the change under consideration.

PART I—CHANGES IN THE TRADEMARK ACT OF 1946, AS AMENDED

A. *Requirements for Registration on the Principal Register*

1. As an alternative to actual use, a trademark, service mark, certification or collective mark, can be registered by a person based on a declared intention to use the mark in commerce. [Article 19(3), (4)]. Special use requirements are applicable to registrations secured on this basis. (See B below).
2. As an alternative to signing by the applicant, an application may be signed by a duly appointed representative. (Article 26). Present qualifications for representation before the Patent Office (attorney admitted to practice in a State or District of Columbia) continue to apply, however.
3. Verified statement of the claim to ownership is no longer required (Article 5).

B. *Special Requirements for Intent Applicants/Registrants*

1. (*a*) Applicant/registrant must commence use of the mark in commerce within three years of filing date and must declare such commencement of use during the fourth year, including the same details, etc., use dates, label specimens, etc.) as those declared by a use applicant at time of filing. [Article 19(3)].
   (*b*) Time period for filing the declaration may be shortened (three months from date of notice) on petition of interested person if the mark is involved in any proceeding under the Act on or after date of expiration of the three year use moratorium.
   Alternative: Shorter period for filing the declaration (e.g., 3½ years) and delete (*b*) above.
2. Consequence of failure to file an acceptable declaration within the prescribed time limit is cancellation of the registration or, if still pending, refusal of the application. Consequence of compliance as to part only of the goods and/or services is limitation of the registration or application to those goods and/or services. [Article 19(3)].
3. Time period for commencement of use may be extended beyond three years only upon showing of special circumstances which justify non-use.
4. Where later intent application(s) for same mark is (are) filed by the same or a related person prior to four (*Alternative*: five) years from the filing date of the earliest one, the period for commencement of use (three years) is counted from the filing date of earliest application. This provision means that a person cannot abuse the intent to use provisions by filing successive intent applications at or close to the expiration of successive three year periods, securing a new three year moratorium on use requirements with each new case. [Article 19(3)].

C. *Related Company Provision*

A minor change provides that intended use as well as use may inure to benefit of a related company. Thus, for example, an intent application by a parent company would be valid if the evidence supporting the intent concerned adoption of the mark by and related activities of a controlled subsidiary.

D. *Registration on the Principal Register*

1. If a registration based on an intent application is issued before the declaration of use is filed, the certificate of registration indicates this fact in lieu of the dates of use.
2. *Date of registration* is the same date as the filing date, which is defined as the date on which all basic elements of an application are received by the Patent Office. (See Trademark Rule 2.21.) Certificate also indicates the *date of issue*, defined as the date of the OFFICIAL GAZETTE in which notice of the issuance of the registration is published. [Article 11(2)].
3. A certificate of registration is prima facie evidence of the validity of the registration, the right of the registrant to exclude any other person from securing or maintaining a confusingly similar registration, and the exclusive right to use only for those goods or services in respect of which the mark is declared in the certificate of registration, or in a subsequently filed declaration of use, to be in use in commerce.

E. *Duration of Registration, Sixth Year Affidavit and Renewal*

1. Term of registration and of renewal is changed from twenty years to ten years, counted from the *date of registration*. [Article 17].
2. Sixth year affidavit of use remains applicable to all registrations, with its due date counted from *date of issue* of the registration (Change only in terminology).
   Alternative: Same, except that due date is counted from *date of registration*.
3. Sixth year affidavit must show use *in commerce*.
4. A renewal application need not be verified. (Article 17).
5. A late renewal application may be filed within six months (rather than three) after the date of expiration of the term. (Article 17).

F. *Assignment*

An application or registration based on intent is not assignable prior to filing the declaration of use. Exception: successor to the entire business of the original applicant.

Alternative: Assignments of registered or applied for marks without good will are valid.

G. *Examination Procedure and Oppositions*

1. Time for response to office actions is reduced from six months to three months. Purpose is to expedite completion of ex parte examination in maximum number of cases prior to cut-off. (See 3 below).
2. No mark may be refused ex parte for a reason *not* communicated to applicant prior to fifteen months from the filing date. This limitation is not applicable to a refusal determined by a decision of the TTAB or a court. [Article 12(2)].
3. Cut-off at twelve months from filing date for publication of the mark for opposition, whether or not the ex parte examination, including any appeal therefrom, has been completed. If an opposition is filed against a still pend-

ing case, full opposition proceedings are deferred until completion of the ex parte examination. If the opposed mark is eventually determined to be registrable, then full opposition proceedings are commenced, unless the opposer withdraws. [Article 12(2)].

Alternative: Publish all marks promptly after filing and receive oppositions concurrently with the ex parte examination, deferring full opposition proceedings (as above), however, until completion of the ex parte examination.

4. Oppositions need not be verified and may be filed by a duly authorized attorney.
5. Time to oppose may not be extended to a date later than fifteen months, counted from the filing date. [Article 12(2)].

H. *Cancellation of Registrations*

1. A petition to cancel need not be verified and may be filed by a duly authorized attorney.
2. The time period for cancellation based on unrestricted grounds (i.e., 5 years) is counted from the *date of issue* of the registration (Change only in terminology).

I. *Incontestability*

The time period for incontestability is counted from the *date of issue* of the registration (Change only in terminology).

J. *Appeals*

Minor change provides for an appeal from a refusal to accept a declaration of use.

K. *Constructive Notice*

Constructive notice is applicable from *date of issue* of registration (Change only in terminology).

Alternative: Constructive notice applicable as of the date of first publication.

L. *The Supplemental Register*

1. Special Requirement of one year's use prior to filing date is deleted, making Supplemental Register registrations subject to the same use requirements, i.e., use or intention to use, as registrations on the Principal Register. [Article 19(3)].
2. Petition to cancel a Supplemental Register registration need not be verified and can be filed by a duly authorized attorney.
3. Non-use is a ground for cancellation only after expiration of three years from the filing date. [Article 19(3)].

M. *Infringement Remedies, Evidence and Priority*

1. Owner of a registration based on an intent application may not start any action for infringement until the declaration of use has been filed and accepted. Any remedies for infringement of registered marks based on intent are applicable only to period after commencement of continuing use. [Article 19(3)].
2. A certificate of registration is prima facie evidence of exclusive right to use only for those goods or services in respect of which the mark is declared in the certificate of registration, or in a subsequently filed declaration of use, to be in use in commerce. (Consistent wtih M 1 above).
3. In an action based on an incontestable registration, defense based on innocent adoption and continuous use (i.e., section 33(b)(5)) is subject to the condition that the defendant must be innocent of knowledge not only of prior use of the registrant, but, where applicable, of registration based upon a previously filed declaration of intention to use.
4. For the purpose of determining priority of rights in *any* proceeding under the Act, an application or registration based on intent to use is accorded the same effect *as if* the applicant or registrant had commenced use of the mark in commerce on the filing date. Except where priority is accorded in a Patent Office proceeding, or in an appeal therefrom, prior to three years from the filing date. a condition to the according of priority on this basis is filing and acceptance of the declaration of use. [Article 19(3)].

N. *International Convention Provisions*

1. The waiver of use requirements for an application based on registration of the mark in a country with which we have a treaty relationship is deleted. Since all applicants have the alternative of securing a registration based on an intention to use the mark in commerce, the waiver of use requirements is no longer necessary and such applications are subject to all requirements of the Act. Similarly, the first sentence of section 44(e) is deleted, being unnecessary in view of the general limitation on actions for infringement based on unused marks. (See M 1).
2. A minor change in section 44(d)(4) provides that a registration based on intent is not subject to the limitation of this subparagraph if the declaration of use has been accepted prior to issuance of the registration.

O. *Definitions*

1. The words "or intended to be used" are inserted in several of the definitions to take into account the new basis for registration.
2. Filing date, date of issue and date of registration are defined. (See D 2). Careful definition of "filing date" is important since it is the basis for determining the priority of intent applications. (See M 4).
3. The definition of abandonment is modified to the extent that non-use for two consecutive years is prima facie abandonment only if the two year period terminates on a date later than the date of expiration of three year use moratorium. Also, failure to commence use within the prescribed period, coupled with absence of any intention to commence use, constitutes abandonment. [Article 19(3)].

PART II—IMPLEMENTATION OF TRADEMARK REGISTRATION TREATY

A. *Definitions*

For purposes of the Act, an international application, international registration or later designation under the Trademark Registration Treaty (TRT) is defined to include only one which designates the United States; contains a declaration of intention to use the mark in commerce with or in the United States (or is accompanied by a declaration of actual use of the mark in such commerce); and is published and communicated to the Patent Office as required by the TRT. [Articles 10, 11, 19(4)].

B. *Effect in the United States of Proceedings Under the Treaty*

1. International applications, international registrations and later designations as defined above (See A), and the recordings related thereto, are accorded all of the effects, and their applicants or owners are entitled to all of the benefits, in the United States provided by the TRT, subject to all of the requirements of the TRT and, except as listed below, of the Trademark Act.
2. Exceptions to full application of the Trademark Act are:
   (a) The fee referred to in section 1 is waived. (*Note:* A fee equivalent to the U.S. application fee is paid to the International Bureau and the amounts of the fees collected on behalf of the United States are paid to the U.S. in lump sums.) [Article 19(1)].
   (b) The requirement to designate an agent for service in the application [i.e., present section 1(d)] is waived, provided that such person must be designated on or prior to date on which the owner replies to any communication by the examiner or otherwise institutes or defends any proceeding under the Act. Until such person has been designated, notices or process may be served upon the Commissioner. Consequence of failure to designate such person on or prior to the first to occur of the above events is cancellation of any effect of the international registration in the United States. [Article 19(7)].
   (c) A certificate of registration issued by the Patent Office based on an international registration shall also indicate the number and date of the international registration to which it relates.
   (d) The *filing date* under the Act of an international registration is the international registration date. The *date of issue* is the date on which registration effect in the United States of an international registration comes into existence pursuant to a notice to this effect published in the OFFICIAL GAZETTE, as

in the case of publication of issuance of a national registration. [Article 11(1)(2)].

(e) The recording of a change in ownership, or in the name of the owner, of an international registration shall not be accorded any effect as the recording of an assignment unless, within three months from the date of publication of such recording under the TRT, instruments of assignment conforming to the requirements of the Trademark Act are recorded in the Patent Office. [Article 14(4)].

(f) Renewal of the effect of an international registration in the United States by the International Bureau is not subject to the requirements of section 9, provided that the registrant shall file in the Patent Office, prior to the expiration of six months counted from the starting date of the term of renewal, a declaration as to use of the mark in commerce. Consequences of failure to file an acceptable use declaration are the same as in the case of failure to file or filing of an unacceptable fourth year declaration of use (See Part I, B 2).

Note: The renewal fee is collected and distributed in the same way as the filing fee. (See (a) above.) [Article 17, 19(1), 19(3)].

C. *Authority of the Commissioner*

The Commissioner is authorized to accord and deny effects, communicate notifications, make attestations, decide petitions, determine the amount of and receive payments of fees, and perform all other acts as provided by the TRT, subject to the requirements thereof.

D. *Notifications*

The Commissioner is required to effect all required notifications promptly. Where the time limitation of the TRT is stated in terms of the date of receipt, the notification shall be transmitted to the International Bureau no later than 14 days from the due date via Registered Air Mail.

* * * * *

Final Note: The above outline does not include final provisions concerning the effective date of certain changes. Generally, changes that might have an effect on existing rights would be effective only as to applications filed on or after the effective date of the amended Act.

[922 O.G. TM 1, 2, 3 (May 28, 1974)]

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(329) TRADEMARK MANUAL OF EXAMINING PROCEDURE NOW AVAILABLE

The Trademark Manual of Examining Procedure (designated in brief as TMEP) may be ordered on a subscription basis from the Superintendent of Documents at the following address:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The price of a subscription is $8.10, plus $2.05 for foreign mailing. Payment should accompany the order. (Orders should *not* be placed with the Patent Office.)

The purpose of the Trademark Manual of Examining Procedure is to provide an authoritative reference work on practices and procedures relative to prosecution of applications to register marks in the Patent Office. Revisions necessary to keep the Manual current will be made by issuance of sets of revision pages from time to time as part of the Manual subscription. Early information as to changes in the Manual will be given prior to issuance of revision pages by notices in the OFFICIAL GAZETTE or by change notices furnished to Manual subscribers.

The Trademark Directives which were issued as Series 1 (pre-Manual) pending publication of the Manual, have been incorporated in the Manual, and there will be no further Directives in that Series. (For announcements as to the pre-Manual Directives, see OFFICIAL GAZETTES of August 31, 1971, Vol. 889, No. 5, and April 4, 1972, Vol. 897, No. 1.)

RENE D. TEGTMEYER,
May 29, 1974. *Assistant Commissioner for Trademarks.*

[923 O.G. TM 204 (June 25, 1974)]

(330) SHORT TITLES FOR INTERNATIONAL TRADEMARK CLASSES

The United States Patent Office will, effective immediately, associate the following word titles with the respective international trademark class numbers:

GOODS

1 Chemicals
2 Paints
3 Cosmetics and cleaning preparations
4 Lubricants and fuels
5 Pharmaceuticals
6 Metal goods
7 Machinery
8 Hand tools
9 Electrical and scientific apparatus
10 Medical apparatus
11 Environmental control apparatus
12 Vehicles
13 Firearms
14 Jewelry
15 Musical instruments
16 Paper goods and printed matter
17 Rubber goods
18 Leather goods
19 Non-metallic building materials
20 Furniture and articles not otherwise classified
21 Housewares and glass
22 Cordage and fibers
23 Yarns and threads
24 Fabrics
25 Clothing
26 Fancy goods
27 Floor coverings
28 Toys and sporting goods
29 Meats and processed foods
30 Staple foods
31 Natural agricultural products
32 Light beverages
33 Wines and spirits
34 Smokers' articles

SERVICES

35 Advertising and business
36 Insurance and financial
37 Construction and repair
38 Communication
39 Transportation and storage
40 Material treatment
41 Education and entertainment
42 Miscellaneous

These short titles are not an official part of the international classification. Their purpose is to provide a means by which the general content of numbered international classes can be quickly identified. Therefore the titles selected consist of short terms which generally correspond to the major content of each class but which are not intended to be more than merely suggestive of the content. Because of their nature these titles will not necessarily disclose the classification of specific items. The titles are not designed to be used for classification but only as information to assist in the identification of numbered classes. For determining classification of particular goods and services and for full disclosure of the contents of international classes, it is necessary to refer to the Alphabetical List of Goods and Services and to the names of international classes and the explanatory notes in the volume entitled "International Classification of Goods and Services to Which Trade Marks Are Applied," published by the World Intellectual Property Organization (WIPO). The full names of international classes appear also in Section 6.1 of the Trademark Rules of Practice.

The short titles are being printed in the OFFICIAL GAZETTE in association with the international class numbers under MARKS PUBLISHED FOR OPPOSITION, Sections 1 and 2, under TRADEMARK REGISTRATIONS ISSUED, PRINCIPAL REGISTER, Section 1, and under SUPPLEMENTAL REGISTER, Sections 1 and 2.

Adoption of the international classification by the United States as its system of classification was announced in the OFFICIAL GAZETTE of June 26, 1973 (911 O.G. TM 210).

Date: June 18, 1974.

RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

[924 O.G. TM 155 (July 16, 1974)]

(331) HAND DELIVERY OF TRADEMARK PAPERS

Trademark papers which are not accompanied by fees or by authorization to charge a deposit account, may be filed by hand in the Trademark Docket Section or in the Incoming Mail Section of the Mail and Correspondence Division. However, to avoid confusion concerning money matters, when papers which are accompanied by fees or by authorization to charge a deposit account are filed by hand, they should be delivered only to the window in the Incoming Mail Section of the Mail and Correspondence Division where personnel can immediately refer the money or the charge to the Cashier. Trademark Examiners should not be requested to receive papers for filing (either with or without fees) since there is no convenient procedure by which the Examiners can transmit such papers to proper locations.

If a receipt is desired from the Trademark Docket Section, it may take the form of a duplicate copy of the paper or of a card identifying the paper and the application. The receipt will be date-stamped at the same time as the paper and handed back to the person delivering the paper. If a receipt is desired from the Incoming Mail Section, a card should be used. The card will be date-stamped and handed back to the person delivering the paper.

When a card is used for receipt, it should contain sufficient information to identify the paper and the application clearly, such as applicant's name, the serial number and filing date of the application, the mark, and the title or a description of the paper being filed.

In the discretion of the Assistant Commissioner for Trademarks, or of the Director of the Trademark Examining Operation, or of the Trademark Trial and Appeal Board, papers appropriate for those Offices (such as petitions or briefs) may be filed by hand in such Offices.

The procedure set forth in the notice entitled "Hand-Delivery of Papers" in the OFFICIAL GAZETTE of February 26, 1974 (919 O.G. TM 180) pertains to papers for patent applications. The designation "Examining Group" used in that notice relates to the patent examining area of the Patent Office. (The equivalent designation in the trademark examining area is "Examining Division.")

RENE D. TEGTMEYER,
Aug. 21, 1974. *Assistant Commmissioner for Trademarks.*

[926 O.G. TM 132 (Sept. 17, 1974)]

(332) TRADEMARK REGISTRATION TREATY POST CONFERENCE INFORMATION

The text of the Trademark Registration Treaty (TRT), signed in 1973 for the United States and 13 other States, was reproduced in the OFFICIAL GAZETTE of July 24, 1973. The substance of post conference documents on the history of the treaty, a brief summary of its provisions and advantages, and explanatory notes on each of the articles, were reproduced in the OFFICIAL GAZETTE of March 12, 1974. In addition, an outline of the possible changes in the "Trademark Act of 1946, As Amended," which may be required or desirable if the Trademark Registration Treaty is ratified and implemented was published in the OFFICIAL GAZETTE of May 28, 1974.

The World Intellectual Property Organization (WIPO), which served as the Secretariat of the Vienna Diplomatic Conference at which the Trademark Registration Treaty was adopted, has now circulated an additional post conference document, consisting of explanatory notes on the regulations under the treaty. These notes are intended to facilitate the reading of the text of the regulations, providing, where a rule refers to certain articles of the treaty or to other rules of the regulations, brief information on those articles or other rules. This document is supplemental, and similar in format, to the one comprising notes on the articles which was published on March 12, 1974.

The Office will supply a photo copy of these explanatory notes on the TRT regulations (TRT/PCD/4, dated July 31, 1974) to any interested person who may request such copy.

C. MARSHALL DANN,
Dated: Sept 17, 1974. *Commissioner of Patents.*

[927 O.G. TM 124 (Oct. 15, 1974)]

(333) REALIGNMENT OF PATENT OFFICE HANDLING OF OPPOSITION PAPERS

In order to increase efficiency in processing papers, all activities connected with the handling of oppositions have been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board. As a result of the transfer, requests for extension of time to oppose and matters pertinent thereto are now received and processed by the staff of the Trademark Trial and Appeal Board rather than by the staff of the Office of the Director of the Trademark Examining Operation.

No substantial change in procedure in the handling of papers relative to oppositions and extensions of time is contemplated by this realignment of duties in the Patent Office. Reasonable requests for extensions of time to oppose will continue to be granted with liberality particularly if there is no protest by another party and if the parties are negotiating or otherwise exploring bases for settlement, and fees for both verified and unverified oppositions will continue to be required to be filed within the time prescribed for opposing.

RENE D. TEGTMEYER,
Nov. 14, 1974. *Assistant Commissioner for Trademarks.*

[929 O.G. TM 62 (Dec. 10, 1974)]

(334) TRADEMARK SEMINAR IN OFFICE PRACTICE AND PROCEDURE

A Seminar in Office Practice and Procedures was established in 1973 as a training course for new trademark examiners. The course covers all phases of trademark law, office practice and procedure. The seminar deals with both substantive and procedural issues. Among the topics covered are types of marks, types of applications and registrations, ownership of marks, procedural and substantive examination of application, with emphasis on the statutory grounds for refusal to register, classification of goods and searching.

Members of the Seminar will prosecute a sample application through the various stages of Office procedures beginning with the initial examination and preparation of a first action, the final refusal to register based on statutory grounds, the writing of an examiner's statement on appeal, and concluding with an oral hearing before the Trademark Trial & Appeal Board.

Lectures are conducted by supervisory personnel, senior examiners, members of the Trademark Trial & Appeal Board and attorneys from outside the Patent Office.

The Seminar is given in the U.S. Patent Office, 2011 Jefferson Davis Highway, Crystal Plaza, Arlington, Va. The Seminar is conducted twice a year. The next course is scheduled for Feb. 3 to March 7, 1975. Classes meet from 9:00 A.M. to 11:30 A.M. Monday through Thursday.

While the course is intended for new trademark examiners, a limited number of applicants from government agencies and from outside the government will be accepted for training on a space available basis. The Seminar is normally limited to ten students. To be eligible for training, a candidate should possess a law degree, and be involved in trademark practice. The fee for attendance at this course is $400.00.

Additional information concerning this Seminar may be obtained from the Office of Trademark Program Control at the Patent Office. Inquiries should be addressed to the Commissioner of Patents, U.S. Patent Office, Washington, D.C. 20231, Attention: Office of Trademark Program Control, or by telephone at 703-557-3881.

RENE D. TEGTMEYER,
Jan. 3, 1975. *Assistant Commissioner for Trademarks.*

[930 O.G. TM 246 (Jan. 21, 1975)]

(335)

Public Law 93-600
93rd Congress, H. R. 8981
January 2, 1975

An Act

88 STAT. 1955

To amend the Trademark Act to extend the time for filing oppositions, to eliminate the requirement for filing reasons of appeal in the Patent Office, and to provide for awarding attorney fees.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Trademarks. Extension for filing oppositions. 15 USC 1063.

SECTION 1. Section 13 of the Trademark Act of 1946 (60 Stat. 427), as amended, is amended by deleting the second sentence and substituting therefor: "Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further extensions of time for filing opposition may be granted by the Commissioner for good cause. The Commissioner shall notify the applicant of each extension of the time for filing opposition.".

15 USC 1071.

SEC. 2. Section 21 of the Trademark Act of 1946 (60 Stat. 427), as amended, is amended by deleting subsections (2). (3). and (4) from paragraph (a) and substituting therefor:

Notice of appeal.

"(2) Such an appeal to the United States Court of Customs and Patent Appeals shall be taken by filing a notice of appeal with the Commissioner, within sixty days after the date of the decision appealed from or such longer time after said date as the Commissioner appoints. The notice of such appeal shall specify the party or parties taking the appeal, shall designate the decision or part thereof appealed from, and shall state that the appeal is taken to said court.

Hearing, notice.

"(3) The court shall, before hearing such appeal, give notice of the time and place of the hearing to the Commissioner and the parties thereto. The Commissioner shall transmit to the court certified copies of all the necessary original papers and evidence in the case specified by the appellant and any additional papers and evidence specified by the appellee, and in an ex parte case the Commissioner shall furnish the court with a brief explaining the grounds of the decision of the Patent Office, touching all the points involved in the appeal.

"(4) The court shall decide such appeal on the evidence produced before the Patent Office. The court shall return to the Commissioner a certificate of its proceedings and decision, which shall be entered of record in the Patent Office and govern further proceedings in the case.".

Attorney fees. 15 USC 1117.

SEC. 3. Section 35 of the Trademark Act of 1946 (60 Stat. 427), as amended, is amended by adding the following sentence at the end thereof: "The court in exceptional cases may award reasonable attorney fees to the prevailing party.".

Effective date. 15 USC 1063 note.

SEC. 4. This Act shall become effective upon enactment, but shall not affect any suit, proceeding, or appeal then pending.

Approved January 2, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 93-524 (Comm. on the Judiciary).
SENATE REPORT No. 93-1400 (Comm. on the Judiciary).
CONGRESSIONAL RECORD:
Vol. 119 (1973): Oct. 15, considered and passed House.
Vol. 120 (1974): Dec. 18, considered and passed Senate.

[931 O.G. TM 58 (Feb. 11, 1975)]

(336)

REPORT

OF THE

UNITED STATES DELEGATION

TO THE

VIENNA DIPLOMATIC CONFERENCE ON INDUSTRIAL PROPERTY, 1973

Vienna, Austria

May 17 to June 12, 1973

Submitted to the Secretary of State

DANIEL M. SEARBY,
Chairman of the Delegation.

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1. TITLE, SITE AND DATE OF CONFERENCE

Vienna Diplomatic Conference on Industrial Property, 1973, Vienna, Austria, May 17 to June 12, 1973.

2. BRIEF BACKGROUND

The Vienna Diplomatic Conference on Industrial Property was held from May 17 to June 12, 1973, with the Government of Austria serving as the host. Within the framework of the Diplomatic Conference, there were three Conferences: (a) the Conference on the Trademark Registration Treaty; (b) the Conference on the Protection of Type Faces and their International Deposit; and (c) the Conference on the International Classification of the Figurative Elements of Marks.

(a) *Conference on the Trademark Registration Treaty*

One of the most important international trademark problems for American companies is the complexity and high cost of establishing and protecting trademarks in foreign markets under national laws and procedures. Separate actions in approximately 150 different jurisdictions (i.e., independent states, possessions, territories, etc.) are now required in order to extend protection of a mark throughout the world.

The Patent Office, with the support of the Bureau of International Commerce in the Commerce Department and the Department of State, engaged in an extensive study of the question of U.S. participation in an international trademark filing agreement beginning in 1965. Consideration was first given to the possibility of U.S. adherence to the existing Madrid Agreement for International Registration of Marks, which is a special arrangement under the basic Paris Industrial Property Convention to which the U.S. is a party. By 1968, it became clear that there was substantial opposition by certain private interests to U.S. adherence to the Madrid Agreement in its present form. During the period 1968–1970 consideration was given to revision of the Madrid Agreement with a view to bringing in not only the U.S. but other important nonmember countries such as the United Kingdom and Japan.

The effort to develop a new trademark registration agreement was initiated by a United States-sponsored resolution which was approved unanimously by the administrative organs of the Paris Convention in September 1970. It was undertaken within the broader framework of the Paris Convention, which has 80 member States, rather than the more restricted Madrid Agreement, which has only 21 member States. This effort was directed toward establishing a new treaty—the Trademark Registration Treaty (TRT).

A series of preparatory meetings were held at which drafts of the Treaty and Regulations were developed. These meetings included a Consultants Group in March 1971 and three Committees of Experts in October 1971, May 1972, and December 1972.

On the basis of these meetings, the World Intellectual Property Organization (WIPO), the Secretariat for both the Paris Industrial Property Convention and the Madrid Agreement, prepared various drafts of the TRT. Certain of these drafts were published by the U.S. Patent Office and circulated to all interested parties (e.g., American Bar Association, National Association of Manufacturers, U.S. Trademark Association) in the United States for comment. Patent Office personnel also held numerous meetings with interested groups to explain and discuss the TRT.

(b) *Conference on the Protection of Type Faces and their International Deposit*

There were a number of meetings on the question of creating a special international agreement for the protection of type faces during the 1960's. U.S. interest and participation in these earlier meetings was limited. About 1970 U.S. industry had become more concerned about the possibility of providing some form of protection for type faces. As a consequence, the U.S. did participate in the fifth session of the Committee of Experts in February 1971 and the sixth session of the Committee in March 1972.

Designing a new type face is an important corollary activity of manufacturers of typesetting machines. The design of a new type face is expensive. Therefore, U.S. industry and the various typographic associations are very much interested in design protection. New technological developments in phototypesetting equipment have made it imperative to have new type faces for these machines.

Under U.S. law, however, except for so-called exotic type faces, the present design patent protection is very limited and, from the viewpoint of private industry, inadequate. Further, the existing Copyright Office regulations are such that type faces are not subject to copyright.

The United States was invited by the Director General of the World Intellectual Property Organization to be represented at the Vienna Conference with respect to the negotiation of an Agreement for the Protection of Type Faces.

Because of the strong interest of the U.S. type face industry, the United States decided to participate in the negotiations but not to sign the Agreement.

(c) *Conference on the International Classification of the Figurative Elements of Marks*

The general purpose of this Agreement is to establish uniformity among countries with respect to the development and use of a classification system which could be applied to the design elements of trademarks.

The existing Nice Agreement, to which the United States is a party, has already established an international classification of goods and services for the purpose of registering trademarks and service marks.

A 1971 Committee of Experts discussed the question of the diplomatic instrument that might serve as a legal framework for the proposed Classification of Figurative Elements. Since opinion in the Committee was divided, the Committee of Experts finally concluded that it would be preferable to submit two alternative drafts to the Vienna Diplomatic Conference: a draft Protocol, an Additional Act, to be annexed to the Nice Agreement, and the draft of a separate Agreement.

* * * * *

9. CONCLUSIONS

(a) *Trademark Registration Treaty*

In order to become a party to the Trademark Registration Treaty, the United States is required to effect material changes in its trademark law, principally the granting of limited national registration effect to marks which are not in use during the available three year period when use is not required. There are differences of opinion in the private sector as to the desirability of these changes as well as others of lesser importance which the treaty requires.

(b) *Agreement for the Protection of Type Faces and Their International Deposit*

The United States would, if it became a party to the Type Faces Agreement, probably accord protection under its copyright law. Some amendment of the copyright law may be required for this purpose. However, a new Register of Copyrights was appointed in November 1973 and she is reviewing the question of protection of type faces. A new interpretation of the copyright law may justify do-

mestic copyright protection and may facilitate U.S. acceptance of this Agreement.

(c) *Agreement Establishing the International Classification of the Figurative Elements of Marks*

The Agreement Establishing the International Classification of the Figurative Elements of Marks closely parallels both the Nice and Strasbourg Agreements and is generally acceptable to the United States. However, we do not contemplate becoming a party to the Figurative Elements Agreement at the present time. The existence of the Agreement presents no problem for the United States but permits an opportunity for us to do in-depth studies of the revisions of the Classification in order to determine our particular interest in the system.

[931 O.G. TM 6 (Feb. 11, 1975)]

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(337) CONFERENCE OF PARTIES IN TRADEMARK INTER PARTES PROCEEDINGS

Under the inter partes rules of procedure in trademark cases effective July 1, 1972 (898 O.G. TM 170, May 16, 1972), the interlocutory phases of trademark inter partes proceedings are becoming increasingly involved, and the experience of the Trademark Trial and Appeal Board has been that the difficulties in such proceedings can frequently be resolved more satisfactorily and quickly by conference in person than by correspondence or telephone. Therefore, effective immediately, the following practice is being adopted:

> Whenever it appears to the Trademark Trial and Appeal Board that questions or issues arising during the interlocutory phase of a trademark inter partes proceeding have become so complex that their resolution by correspondence or telephone is not practical and would be likely to be facilitated by conference in person of the parties and/or their attorneys with a member or members of the Trademark Trial and Appeal Board, the Board may at its discretion suggest that the parties and/or their attorneys, under circumstances which will not result in undue hardship for any party, meet with the Board at its offices in Crystal Plaza, Arlington, Virginia, to discuss the resolution of difficulties.

C. MARSHALL DANN,
Feb. 3, 1975. *Commissioner of Patents and Trademarks.*

[932 O.G. TM 2 (Mar. 4, 1975)]

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(338) PATENT AND TRADEMARK CASES

[37 CFR Parts 1, 2, 4]

Rules and Procedures

Notice is hereby given that, pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440, 15 U.S.C. 1123) and section 6 of the Act of July 19, 1952 (66 Stat. 793, 35 U.S.C. 6), as amended October 5, 1971 (85 Stat. 364), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.12, 1.136, 1.197, 1.244, 1.256, 1.304, 2.18, 2.37, 2.75, 2.80, 2.85, 2.101, 2.102, 2.103, 2.105, 2.111, 2.112, 2.120, 2.123, 2.127, 2.129, 2.141, 2.144, 2.145, 2.162, 2.172, 2.183, 2.185, 2.187 and 4.2.

All persons are invited to present their written views, objections, recommendations, or suggestions in connection with the proposed changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before May 1, 1975. No oral hearing will be held. Written comments or suggestions will be available for examination by interested persons at Crystal Plaza Building 3, Room 11C17a, 2021 Jefferson Davis Highway, Arlington, Virginia.

Assignment records open to public inspection. The proposed revision of § 1.12 is intended to make clear the existing practice that assignment records relating to trademark applications and registrations are open to the public. The present wording, which is based on the amendment of § 1.12 on August 23, 1965 (819 O.G. 443), does not clearly distinguish between the procedure to be applied to patent records and to trademark records. In view of a number of inquiries as to the manner in which the amendment was to be applied, a notice was published in the OFFICIAL GAZETTE of January 18, 1966 (822 O.G. 769) stating that assignments relating to applications for registration of trademarks will be open to public inspection as heretofore. Since assignment records relating to trademark applications and registrations have always been open to the public, which practice continues at the present time, it is believed desirable to make the practice clear.

In the third sentence of the section, language is added to indicate that the requirement for written authority applies only to patent applications.

Time less than six months. It is proposed to revise paragraph (b) of section 1.136 to read "sufficient cause" rather than "good and sufficient cause." This revision is merely for consistency of language with other sections in this part and does not represent any change in practice.

Reconsideration of decision. It is proposed to revise paragraph (b) of § 1.197, paragraph (b) of section 1.256, paragraph (c) of §§ 2.129 and 2.144, to provide that the Board of Appeals, the Board of Patent Interferences, and the Trademark Trial and Appeal Board may, for sufficient cause, extend the time for filing a request for rehearing or reconsideration, or modification of a decision rendered by these Boards. Proposed revised paragraph (b) of § 1.256 and paragraph (c) of § 2.129 provide similar opportunity for extension of time for filing a reply to such a request in inter partes cases. The purpose of these revisions is to eliminate the necessity for waiver of a rule by the Comissioner in order for a party to obtain an extension of time.

In these sections, as well as in the related §§ 1.244(c), 2.127(b), 1.304 and 2.145(d), it is proposed to use the term "request" rather than "petition" in connection with rehearing or reconsideration, in order to avoid redundancy and in order to clearly distinguish such action from a petition to the Commissioner.

Time for appeal or civil action. Proposed revised § 1.304 and proposed revised paragraph (d) of § 2.145 clarify the portion of each which relates to the time for filing appeal or commencing civil action in cases where a request for rehearing or reconsideration, or modification of a decision, is filed. Present §§ 1.304 and 2.145(d) provide for an extension of time for appeal or civil action if a request for rehearing is filed within thirty days after a decision, but their language is subject to the interpretation that they deny any extension if the request for rehearing is filed more than thirty days after the date of a decision. It has been the practice of the Patent and Trademark Office, however, in those cases where the thirty days to file a request for rehearing has been enlarged by waiver of rule by the Commissioner under § 1.183 or § 2.148, to consider the waiver as also applying to the thirty day period specified in §§ 1.304 and 2.145(d). *Dresser Industries, Inc.* v. *Safety-Kleen Corporation*, 183 USPQ 180 (Comr. Pats. 1974).

In order to clarify the meaning of § 1.304 and paragraph (d) of § 2.145, it is proposed to revise these sections to eliminate all reference to a definite time for filing a request for rehearing, and to include instead reference to the provisions for filing request for rehearing which are made in §§ 1.197(b), 1.256(b), 2.129(c) and 2.144. Such sections are proposed to be revised to provide for extension of the basic time specified therein.

Proposed revised § 1.304 and paragraph (d) of § 2.145 also provide that the time for appeal or commencing civil action (whether it be the original sixty days, or the thirty days extension after decision on a request for rehearing) may be extended by the Commissioner upon a showing of sufficient cause.

Proposed revised § 1.304 is arranged in three subsections identified as (a), (b) and (c), and paragraph (d) of § 2.145 is arranged in three subsections identified as (1), (2) and (3). The purpose of separate subsections is to provide a means for easier reading and understanding of these sections in view of the fact that three different points are included in the sections. The proposed rearrangement does not affect practice.

Elimination of reasons of appeal in trademark cases. It is proposed to revise paragraphs, (a), (b) and (d) of § 2.145 to eliminate reference to the need to file the reasons of appeal in the Patent and Trademark Office when appealing a decision of the Trademark Trial and Appeal Board to the U.S. Court of Customs and Patent Appeals, consistent with the modification of section 21 of the trademark act made by Pub. L. 93–600, enacted January 2, 1975.

Recognition for representation, powers of attorney, and correspondence with attorney. It is proposed to revise § § 2.18 and 4.2 to clarify the existing practice of the Patent and Trademark Office in relation to firms of attorneys and powers of attorney, and the handling of correspondence with attorneys and other recognized persons, in trademark cases.

Under present practice firms of attorneys are not recognized for practice before the Office in trademark cases. The persons identified in § 2.12 who may represent others before the Office are persons to whom individual responsibility may attach for actions taken and who must conform under § 2.13 to the Code of Professional Responsibility of the American Bar Association. Section 2.12(a) pertains to attorneys at law and does not provide for representation by a firm of attorneys as distinguished from individual attorneys. Further, reference to representation by a firm of attorneys was eliminated from § 2.15 by amendment effective July 2, 1971 (see 890 O.G. TM 60, September 14, 1971). If a firm name is given in the signature location on a paper filed by an attorney, nevertheless under § 2.15 an individual attorney must actually sign the paper.

It is not necessary under existing practice for an attorney at law filing a paper in connection with a trademark case to have a power of attorney from the party whom he represents. Normally, a letter of transmittal on an attorney's letterhead for a paper not required to be signed by the attorney, such as an application, or an attorney's signature on a paper during prosecution, or a personal appearance, is sufficient for an attorney to be recognized as a party's representative. If deemed necessary, further proof may be required under § 2.17 (a) of an attorney's authority to act for a party or an attorney's qualifications under § 2.12(a).

Although not needed, a written power of attorney is accepted if it is filed. Such power may be revoked, and if revoked, the Office will not thereafter recognize such attorney in that case unless he is again specifically appointed. Any written power of attorney which is filed should designate individuals and not firms of attorneys; a power of attorney which designates a firm rather than individuals is not considered to be a power but merely a direction that correspondence be addressed to that firm. (See 890 O.G. TM 60, September 14, 1971.)

It is proposed to eliminate from § 4.2 (power of attorney form) the requirement to identify bar membership, since further proof may be required under section 2.17(a) if there appears to be any reason to question either an attorney's authority to represent a party or an attorney's qualifications under § 2.12(a). It is further proposed to eliminate from § 4.2 present Note (8) which calls for the names of law firm members and their bar membership if a firm name is used, and to add a new Note (8) which indicates that individuals should be appointed and that naming a firm will serve only as a designation of address for correspondence.

Proposed revised § 2.18 is intended to clarify the practice relative to the address to which correspondence is sent by the Office when an attorney at law or other recognized person is acting on behalf of a party. When an attorney or other recognized person is representing a party, correspondence is sent to such attorney or other recognized person at the address specified when such person's representation is established. The Office will not undertake to correspond with more than one person at more than one address. Therefore if another attorney or recognized person files a paper, the paper will be accepted but correspondence will continue to be sent to the address of the attorney or representative as already established in the file until the Office receives written instruction by the attorney or other representative, or by the party being represented, to send correspondence to another address. A subsequently filed power of attorney or authorization of agent is regarded by the Office as a change of address for correspondence even though there is no revocation of the previous power or authorization, but in other situations a specific request is necessary, and language such as "Send correspondence to (giving address, or name and address)", is the most desirable means for changing the correspondence address. Other types of statements will be accepted by the Office if their intention is sufficiently clear to be reasonably interpreted as a request to change the address to which correspondence is to be sent. Neither the appointment of an associate attorney nor the filing of a paper by a different recognized representative has any effect on correspondence unless an instruction to change the correspondence address is included.

The Office does not send notice or acknowledgment of changes of address. Only a written revocation of a written power of attorney is acknowledged by the Office.

Designation of domestic representative by person not domiciled in the United States. In § 2.37 and paragraph (a)(4) of § 2.185, it is proposed to change the terms "appointment" and "resident agent" to "designation" and "domestic representative," respectively, to conform to the language of section 1(d) of the Trademark Act of 1946. This will not change present practice.

Effective filing date for the Supplemental Register. In § 2.75 it is proposed to add the word "effective" before "filing date" in order to make clear the existing practice that, when the filing date of an amendment to convert an application for registration on the Principal Register to an application for registration on the Supplemental Register becomes the filing date of the latter application, such date is considered to be the effective filing date of that application. This change in wording is in agreement with the language "effective filing date" used in § 2.83.

Publication of marks placed in interference. The proposed revision of § 2.80 restores a reference to publication of the mark in case of interference which was omitted inadvertently when § 2.80 was amended as of March 1, 1972 (896 O.G. TM 2). Although interference is not now declared except upon petition to the Commissioner (amendment of § 2.91 as of March 1, 1974 (896 O.G. TM 2)), the practice of publishing the mark when interference is declared was continued.

Fee for petition to revive a multiple class application. It is proposed to revise paragraph (e) of § 2.85 to delete reference to a petition to revive and thereby to make clear that only one fee is required for a petition to revive an abandoned application in which there is more than one class. Section 31 of the trademark act specifies a fee which shall be paid "on filing each petition for the revival of an abandoned application" without qualification as to the number of classes in the application, and therefore only one fee for each petition is considered to be necessary. For the same reason, in connection with multiple class registrations, under existing practice a single fee is sufficient for issuance of a new certificate of registration following change of ownership of a mark (§ 2.171) or correction of a registrant's mistake (§ 2.175), for certificate of correction of registrant's mistake (§ 2.175), or for amendment or disclaimer after registration (§ 2.173).

Fee required for each class being opposed, and insufficient fees for classes in application being opposed. Proposed revised §§ 2.101, 2.102 and 2.103 make clear the existing requirement that when there is more than one class in an application (such as in a combined application), the required fee must be paid for each class when filing an opposition against such application.

These proposed revised sections also provide that when the fees which accompany an opposition are insufficient to cover all classes in the application being opposed, which may occur with a combined application, opposer should specify the classes in which opposition to registration of the mark is sought, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to process the opposition promptly in the particular classes which opposer desires. This is in accord with present practice. See notice in the OFFICIAL GAZETTE of August 11, 1964 (805 O.G. TM 39).

Joining persons in an opposition. Proposed revised § 2.01 provides that two or more persons may be joined in an opposition, but that the required fee for each class in which each person seeks opposition must be paid for each person so joined. By this revision, existing practice is incorporated into this section. See notice in the OFFICIAL GAZETTE of August 11, 1964 (805 O.G. TM 39).

Unverified opposition during extension of time. It is proposed to further revise §§ 2.102 and 2.103 to permit an unverified opposition to be filed by an attorney or agent during an extension of time for opposition as well as within the original thirty days for opposition after publication of the mark. Present practice limits the filing of an unverified opposition to thirty days after publication. Nevertheless it has been found that some oppositions filed during extensions of time are unverified, and that when the defect is discovered, either there is insufficient time in the extended period to file a verified opposition or the period has expired. It seems desirable to eliminate a situation that has in some cases proven to be a difficulty for opposers. Since the main effort and cost of preparing and filing an opposition is expended even though

the opposition is unverified, it is believed that in most instances opposers will file verified oppositions in extended opposition periods. Further, any unverified opposition must be confirmed by opposer by verification or declaration within thirty days after its filing. For both reasons it is believed that the proposed change in practice will not result in any undue delay in registration.

Proposed revised § 2.102 provides that an opposition filed within an extension of time to oppose must be accompanied by the required fee for each class, and states that the oppositions should be verified or include a declaration in accordance with § 2.20. However, in case verification or declaration cannot be secured within the extension of time, proposed revised § 2.103 provides that an unverified opposition may be filed within an extension of time to oppose. Such unverified opposition must be confirmed by opposer by verification or declaration within thirty days after its filing.

Extension of time to oppose. It is proposed to further revise § 2.102 to make clear existing practice as to who may request an extension of time to oppose and who may file opposition during an extension of time. Request to extend the time for filing opposition must be made by a person who is eligible to oppose, that is, a person who believes that he would be damaged by the registration of the mark on the Principal Register. An attorney at law or other person recognized to represent a party may file a request for extension of time on behalf of a potential opposer. *La Maur, Inc.* v. *Andis Clipper Co.*, 181 USPQ 783 (Comr. Pats. 1974). The potential opposer must be identified in the request for extension because an extension of time is a personal privilege which is normally granted only to the person who has requested it. A problem has been, however, that complete information is sometimes not available at the time request for extension of time must be filed, so that there is a misidentification of the potential opposer, or, where there are parties in privity, for example related companies, one of the interested parties is named whereas later the other will be found to be the proper party to oppose. For this reason, it is considered desirable to permit opposition to be filed during an extension of time by a person whose name varies or is different from the name of the person to whom the extension was granted, provided the difference in names constitutes mere misidentification as a result of mistake and is not a difference in entity, or provided the persons designated are in privity, such as in the case of related companies under section 5 of the trademark act. This practice is in accord with the decision in *F. Jacobson & Sons, Inc.* v. *Excelled Sheepskin Co.*, 140 USPQ 281 (Comr. Pats. 1963). An analogous situation is found in *Universal Oil Products Co.* v. *Rexall Drug and Chemical Co.*, 174 USPQ 458 (CCPA 1972), where a parent company was permitted to oppose although the mark on which opposition was based was owned by the parent's subsidiary company.

When there is uncertainty between persons in privity as to which will ultimately be the proper opposer, it is desirable that the persons and their relationships be identified as clearly as possible in the request for extension of time.

First thirty-day extension of time to opposed. It is proposed to revise § 2.102 consistently with Pub. L. 93–600, effective January 2, 1975, which provides for a first thirty-day extension of the time for filing an opposition upon request without showing good cause.

Transmittal of opposition. It is proposed to revise § 2.105 to eliminate reference to transmittal of an opposition by the Examiner of Trademarks to the Trademark Trial and Appeal Board, in view of the fact that all activity connected with the processing of oppositions has been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board.

It is further proposed to revise § 2.105 by changing the word "notice" throughout the section to the word "notification" and also by changing the word "Institution" in the heading of the section to the word "Notification". The purpose of these changes is to make clear the present practice of regarding the paper which is prepared in accordance with this section to be merely a notification to the parties of the existence of a proceeding which commenced at the time the opposition was filed.

Fee required for each class for cancellation, and insufficient fees for classes in registration. Proposed revised § § 2.111 and 2.112 make clear the existing requirement that when there is more than one class in a registration, the required fee must be paid for each class when filing a petition to cancel the registration. A petition to cancel which is accompanied by fees insufficient to cover each class in the registration should specify the classes for which cancellation is sought, so that the Office will not be required to select classes or make further inquiry in that respect, and cancellation may be accomplished promptly in the classes desired. This is in accord with present practice.

Order compelling discovery in inter partes cases. Because of the increasing burden upon the Trademark Trial and Appeal Board as a result of the frequency and complexity of the motions being filed to compel discovery under rules adopted July 1, 1972 (898 O.G. TM 170, May 16, 1972), it is considered desirable that before seeking an order from the Board compelling discovery, the parties themselves be required to attempt to resolve the issues by mutual agreement. It is proposed to accomplish this by revising paragraph (c) of § 2.120 to require that a motion for an order compelling discovery be supported by an affidavit or a declaration in accordance with § 2.20 stating that the moving party or its attorney has conferred with the opposing party or its attorney in good faith in an effort to resolve by agreement the issues raised by the motion and that the parties have been unable to reach agreement with respect thereto, or specifying the parts of the issues, if any, which have been resolved. See *Angelica Corporation* v. *Collins & Aikman Corporation*, 183 USPQ 378 (TT&A Bd. 1974), and *Cool-Ray, Inc.* v. *Eye Care, Inc.*, 183 USPQ 618 (TT&A Bd. 1974).

Requirements for depositions. It is proposed to revise paragraph (g) of § 2.123 by adding a subsection numbered (3) thereto in order to restore to this section a designation of the existing requirements as to the form of depositions which was omitted inadvertently when paragraph (g) of this section was amended as of July 1, 1972 (898 O.G. TM 170, May 16, 1972).

Comments on inter partes procedures in general. In addition to the changes in inter partes procedures which are proposed herein, the Patent and Trademark Office is currently making an overall review of the efficiency and effectiveness of all of the amended inter partes rules of procedure in trademark cases which became effective as of July 1, 1972 (898 O.G. TM 170, May 16, 1972). The Patent and Trademark Office would welcome comments on any present inter partes procedures separate from comments on the specific revisions proposed herein.

Requests for reconsideration of decisions on motions. Motion procedures before the Trademark Trial and Appeal Board under §§ 2.127 and 2.129 follow the Federal Rules of Civil Procedure, which results in a multiplicity of types of motions being available. Some of these could be finally dispositive of a case and appeal could be taken from them. It therefore seems desirable to distinguish in trademark cases between the procedures as to decisions on motions which are finally dispositive of a case and decisions on motions which are not finally dispositive. To accomplish this it is proposed to revise paragraph (b) of § 2.217 to limit the section to motions which are not finally dispositive of a case. Any request for rehearing of such motions must be filed within thirty days, as is the existing practice. It is proposed to revise paragraph (c) of § 2.219 to include a reference to decisions on motions which are finally dispositive of a case and thus to make it clear that a request for rehearing of any final decision (including those on motions) may be filed within thirty days and that such time may be extended for sufficient cause.

Fee required for each class on appeal, and insufficient fees for classes in application on appeal. Proposed revised § 2.141 makes clear the existing requirement that when there is more than one class in an application (such as in a combined application), the prescribed fee must be paid for each class when appealing to the Trademark Trial and Appeal Board.

The proposed revised section also provides that when the fees which accompany an appeal are insufficient to cover all classes in the application being appealed, which may occur with a combined application, applicant should specify the classes in which appeal is taken, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to set up the appeal promptly in the particular classes which applicant desires. This is in accord with present practice.

Requirements for affidavit or declaration under section 8 of the Act of 1946. Proposed revised § 2.162 provides that an affidavit or declaration in accordance with § 2.20 containing either a statement of use or recitation of facts as to excusable nonuse must be filed before the expiration of the specified

sixth year. However, if the evidence supporting the statement of use is not submitted or is found to be deficient, such supporting evidence may be filed thereafter, and may be considered even though filed after the expiration of the sixth year, and if the recitation of facts as to nonuse are found not to be sufficient, further evidence or explanation may be submitted and may be considered even though filed after the expiration of the sixth year. The statement of use or the recitation of facts as to excusable nonuse in the affidavit or declaration meets the statutory requirement of making a showing within the sixth year, although such statement or recitation is not necessarily conclusive and may be required to be supported by other evidence. *In re The Magnavox Company*, 177 USPQ 274 (Comr. Pats. 1973).

The phrase "specifying the nature of such use" is omitted from paragraph (c) of proposed revised § 2.162 because its meaning is unclear and it does not identify any requirement which is necessary for an affidavit or declaration under section 8 of the act.

The proposed revised section also makes it clear that where there is more than one class in a registration, a statement of use or a statement as to nonuse, and appropriate evidence in support thereof, is necessary with respect to each class in the registration, and that the required fee is necessary for each class in the registration. An affidavit or declaration under section 8 which is accompanied by fees insufficient to cover each class in the registration should specify the classes to which the affidavit or declaration pertains, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to determine promptly the question of acceptance or refusal in relation to relevant classes.

Surrender for concellation. Proposed revised § 2.172 makes clear the existing practice of regarding a request to delete one entire class, or more than one entire class but less than the total number of classes, from a registration in which there is more than one class, as a surrender of a registration as to the specified class or classes, and not as an amendment of a registration. Each class is treated in effect as a separate registration. On the other hand, deletion of less than all of the goods or services in a class constitutes amendment of a registration as to that class. No fee is required for surrender, whereas a fee is required for each class which is amended.

Requirements of application for renewal. It is proposed to revise paragraph (c) of § 2.183 to provide that when facts are recited in an application for renewal to show excusable nonuse and such facts are found to be deficient, additional evidence or explanation may be considered by the Examiner even though filed after the expiration of the initial six month period for applying has expired, or after the three month delay period in the class of a delayed application for renewal. The recitation in the application of facts to show excusable nonuse meets the statutory requirement of making a showing within the required time, although such statement or recitation is not necessarily conclusive and may be required to be supported by other evidence. *In re The Magnavox Company*, 177 USPQ 274 (Comr. Pats. 1973).

Section 2.183 as proposed to be revised also makes clear the existing practice that when there is more than one class in a registration, a declaration or verified statement of use and a specimen or facsimile, or a recitation of facts as to nonuse, are necessary with respect to each class in the registration, and that the required fee is necessary for each class in the registration when renewing the registration. An application for renewal which is accompanied by fees insufficient to cover each class should specify the classes with regard to which renewal is desired.

Signature of translator for English translation. The proposed revision of paragraph (a) (2) of § 2.185 is intended to make it clear that the signature necessary for an English translation of a foreign document is the signature of the translator of the document, and that the signature only is needed, not a verification or a declaration in accordance with section 2.20.

Certificate of registration may issue to assignee. Proposed revised § 2.187 sets forth more specifically the procedure for giving notice to the Patent and Trademark Office in time to permit issuance of a certificate of registration in a name other than the name of the original applicant. If an assignment document or a certificate of change of name is of record in the Assignment Division of the Patent and Trademark Office before the notice of publication of a mark is mailed, there is sufficient time for the necessary information to reach the application file before the application is prepared for issuance of the certificate of registration. Also, if at any time prior to the preparation of the application for issue, a paper is filed in an application stating that a document has been filed for recordation, the application can be flagged and held until the necessary information reaches the file from the Assignment Division.

If a certificate of registration is to be issued to an assignee, there must be in the application file an address for such assignee; if there is not, the inquiry necessary to obtain the address may delay the issuance of the certificate of registration.

Change in name of Patent Office. All of the sections proposed to be modified herein have been revised to reflect the change in the name of the Patent Office to the Patent and Trademark Office, and the change in title of the Commissioner of Patents to Commissioner of Patents and Trademarks, in accordance with Pub. L. 93-596, effective January 2, 1975.

* * * * *

Dated: Jan. 28, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:
DAVID B. CHANG,
Assistant Secretary for Science and Technology.

Published in 40 F.R. 6361, Feb. 11, 1975

[932 O.G. TM 84 (Mar. 11, 1975)]

(NOTE.—The text of the revised rules as adopted appears in Item 346 hereinafter.)

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(339)

EXPANDED EXPLANATORY NOTES FOR INTERNATIONAL TRADEMARK CLASSIFICATION

As a part of the international classification for trademarks and service marks, the World Intellectual Property Organization (commonly known as WIPO) has published an alphabetical list of goods and services with an indication of the classes into which the goods and services fall, and in association therewith has published explanatory notes to assist in classifying where it is thought that there is likely to be special difficulty in deciding upon the correct classification. The United States has prepared a set of expanded explanatory notes, to be used in association with the alphabetical list of goods and services prepared by WIPO, which includes essentially all the material in the explanatory notes published by WIPO but which also contains information on additional items. Because of the additional material in the United States notes, they are designated "expanded explanatory notes."

The expanded United States notes identify the international classes by number and by international name. The short titles which the United States has applied to the international class numbers are also included. (See 924 O.G. TM 155 (July 16, 1974).) Under each international class name is the heading "Including" followed by a group of illustrative items; then there is a second heading "Not including" followed by another group of items with indication of the classes in which these items fall. The items chosen are ones in areas where there may be confusion between related classes, and in particular are items which will serve to delineate to a greater extent the problem areas encountered in the examination of trademark and service mark applications in the United States under the international classification system. It is hoped that the expanded notes will provide more understanding of the basis of international classification in accordance with existing WIPO guidelines and will be helpful in determining the classification of goods and services which are not itemized in the international alphabetical list.

The United States expanded explanatory notes deal primarily with goods rather than services, inasmuch as the inter-

national and prior United States classes for services largely coincide as to their contents. The major areas in which the correlation of service classes is not exact are identified in the expanded United States notes.

The first version of the expanded explanatory notes was submitted by the United States to the Committee of Experts of WIPO at its meeting in Geneva, Switzerland, in September 1973, and the subject of expanded notes is still under consideration. The expanded explanatory notes published with this notice are the first revision of the expanded notes prepared by the United States, and the notes may be further revised from time to time as the need arises. The expanded notes are used by the examiners in the United States Patent and Trademark Office as a guide to classification, along with the alphabetical list of goods and services published by WIPO.

RENE D. TEGTMEYER,
Mar. 5, 1975. Assistant Commissioner for Trademarks.

* * * * *

NOTES:

(1) This first revision of the Expanded Explanatory Notes appeared in the OFFICIAL GAZETTE of Apr. 29, 1975 (933 O.G. TM 285).
(2) The terms in parentheses immediately under the class numbers are the short titles which the United States has applied to the international class numbers. See 924 O.G. TM 155 (July 16, 1974).
(3) For information relating to ordering the English edition of the "International Classification of Goods and Services To Which Trademarks Are Applied," see 911 O.G. TM 210 (June 26, 1973). However, prices are subject to change. As of March 1975 the price of the international classification and 5 supplements was 3 pounds 55 pence.

[933 O.G. TM 285 (Apr. 29, 1975)]

(NOTE.—The detailed text of the Expanded Notes appears in section 1401.02(c) of the Trademark Manual of Examining Procedure.)

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(340)

INTERNATIONAL INDUSTRIAL PROPERTY PROTECTION DEVELOPMENTS REPORTS ON CONFERENCES ATTENDED BY OFFICIALS OF U.S. PATENT AND TRADEMARK OFFICE

Representatives of the U.S. Patent and Trademark Office are frequent participants at international intergovernmental meetings where matters relating to industrial property protection are discussed. These include meetings on patent and trademark classification, mechanized information retrieval, assistance programs for developing countries, and periodic conferences pursuant to international treaties to which we are a party.

When the results of these deliberations have been of particular significance, for example, texts of new treaties such as the Patent Cooperation Treaty and the Trademark Registration Treaty, they have been made available to readers of the OFFICIAL GAZETTE by publication of the relevant documents.

To keep readers current on relevant international activities as they occur, even in their evolving state, more frequent status reports seem desirable.

We have in the past solicited views from the private sector on important issues by way of circular letters and questionnaires addressed to heads of organizations, industrial groups and patent law associations. We plan to continue using this method of communication.

In order that the entire readership of the OFFICIAL GAZETTE be kept advised, however, we intend to publish from time to time summary reports of the more significant international meetings that we attend. The first such report follows.

I am hopeful that this series will be helpful. Please do not hesitate to give us your views on the matters presented or your suggestions on how to improve the presentation of this series.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

REPORT ON THE MEETING OF THE AD HOC GROUP OF GOVERNMENTAL EXPERTS ON THE REVISION OF THE PARIS CONVENTION, FEBRUARY 11 TO 17, 1975

This Ad Hoc Group of Governmental Experts was convened pursuant to a resolution of the Coordination Committee of WIPO adopted in September 1974, as follows:

> "The Director General will create and convene an Ad Hoc Group of Governmental Experts coming from states both members and non-members of the Paris Union to study all aspects to the question of revising the Paris Convention including, inter alia, additional provisions of special benefit to the developing countries."

The meeting was well attended; almost fifty countries were represented. Also represented were five intergovernmental organizations and nine international nongovernmental organizations.

The developing countries expressed concern that the systems of patents protection as currently practiced were hampering rather than facilitating the transfer of technology to them. Algeria, Cuba and the Ivory Coast were principal spokesmen. They pointed out that developing countries hold a very small percentage share of the total pool of patents and voiced the view that in too many instances enterprises of developed market economy countries were protecting their exports through the use of patents, to the detriment of industrialization objectives of developing countries.

Accordingly, their major attention was focussed on ways to avoid the utilization of patents in a manner considered by them "abusive" to interests of developing countries. In this regard, they identified a few areas which they thought possibly susceptible to correction by amendment of the Paris Convention.

A change in the national treatment clause of article 2 of the Paris Convention was suggested, based on the contention that the equality principle leads to unequal benefits. Support was expressed for "preferential treatment" for their nationals "without reciprocity." Developing countries urged that compulsory licensing be made available for use by developing countries at an earlier date than is now permitted under the Paris Convention. It was also suggested that a greater transfer of know-how associated with patented technology was needed to accomplish domestic working. Additionally, suggestions were made to exclude certain technological subject matter from the scope of coverage of patent grants and to reduce in certain instances the term of the patent grant.

The Socialist countries, with the Soviet Union as their chief spokesman, expressed a favorable disposition to a "modernization" of the Paris Convention which supported the aspirations of developing countries. They asserted the desirability of incorporating into the Paris Convention provisions for giving greater recognition to inventors' certificates, the principal incentive to inventors in Socialist countries. Another theme repeated by these countries was the desirability of extending industrial property protection provisions of the Convention to include scientific discoveries.

The developed market economy countries also expressed support for promoting the transfer of technology to the developing countries, but pointed out that careful analysis is needed to determine the best ways to accomplish this. In their view, the Paris Convention has been very successful since its inception in promoting international trade in industrial property and the Convention may well be sufficiently flexible to permit

tackling the problems experienced by developing countries without amendment. In any event, the practical problems which are being experienced should be identified with greater precision and clarity so that the approaches developed would be suitable to meet the realities of the current situation.

Several developed market economy countries pointed out the practical reality that the technology which developing countries need is owned privately in industrialized countries. Therefore, the transfer of that technology can only be achieved when the owners of that technology are encouraged to transfer it to the recipient country in a commercial arrangement on mutually acceptable terms based on a comfortable working relationship between the parties.

Attention was also called to the fact that there are several alternative ways of assisting developing countries within the framework of the World Intellectual Property Organization. In particular, mention was made of the preparation of a new Model Law on Inventions, the technical assistance and technical information programs under Chapter 4 of the Patent Cooperation Treaty, and the activities of the Permanent Program for the Acquisition by Developing Countries of Technology Related to Industrial Property. It was also pointed out that some of the desires of the developing countries could be achieved by changes in their national laws, without change in the Paris Convention.

The group of experts after a full discussion adopted the following recommendation:

> *"The Ad Hoc Group of Governmental Experts on the Revision of the Paris Convention for the Protection of Industrial Property,* convened in accordance with the decisions taken at the September 1974 sessions of the Coordination Committee of the World Intellectual Property Organization (WIPO) and the Executive Committee of the Paris Union for the Protection of Industrial Property,
>
> *"Meeting* at Geneva from February 11 to 17, 1975,
>
> *"Noting* the interest that developing countries have manifested in the revision of the Paris Convention,
>
> "1. *Agrees* that, at this stage of the work, the following questions be considered:
>
> (i) National Treatment
> (ii) Independence of Patents
> (iii) to (v) Non-Working and Delays in Working of the Patented Invention; Compulsory Licenses; Licenses of Right
> (vi) Preferential Treatment Without Reciprocity
> (vii) Technical Assistance
> (viii) Types of Protection other than Patents (Inventors' Certificates, etc.)
> (ix) Marks; Industrial Designs; Appellations of Origin
> (x) Reservations
> (xi) Deletion of Article 24
> (xii) Scope of Protection of Process Patents
> (xiii) Right of Priority
> (xiv) Unanimity Rule
>
> "2. *Recommends:*
>
> (*a*) that the Director General, taking into account the need to respect the basic principles of the Paris Convention and to take into consideration the concerns of the developing countries, prepare a study containing an analysis of the issue and outlining possible alternative solutions in respect of the said points and any connected questions,
>
> (*b*) that the report containing the said study be communicated to the Governments of all countries members of the United Nations system of organizations for their comments,
>
> (*c*) that, as a continuation of the work towards the revision of the Paris Convention, the Ad Hoc Group of Governmental Experts be convened, as soon as possible, in a second session,
>
> (*d*) that the competent organs of WIPO and the Paris Union and all other interested organizations, in particular the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Industrial Development Organization (UNIDO), be informed of the results of the first (present) session of the Ad Hoc Group of Governmental Experts,
>
> (*e*) that other United Nations bodies, particularly the United Nations Conference on Trade and Development and the United Nations Industrial Development Organization, interested in the transfer of technology be consulted as to the contribution they could make to the further work of the Ad Hoc Group of Governmental Experts."

The issues forming the basis of the fourteen questions, thirteen of substantive law and one of procedure mentioned in paragraph 1 of the resolution, were developed to some degree by the members of the Committee of Experts as follows:

> "A. *Questions of Substantive Law*
>
> *"Question No. 1: National Treatment.* It was generally understood that the principle of national treatment should remain unaffected in the relations between developed countries,* this term covering both market economy and Socialist countries which are not developing countries. The question here is rather whether, in the relations of developing countries to developed countries, national treatment should not, on certain points—yet to be identified—suffer exceptions totally or within certain limits also to be defined. The total exception to national treatment on certain points may require the definition of minimum standards of protection to be respected in any case. Whether such derogations from national treatment would apply also in the relations between developing countries would also have to be considered.
>
> "The examples of possible cases where certain derogations from the national treatment principle were mentioned concerned smaller fees for nationals than foreigners, the requirements of working the patented invention on the territory of the developing country and the duration of the patent.
>
> "Moreover, the question should be examined whether, in a case where an invention was made by a resident of the country or where an invention was worked in the country, national treatment should not apply unconditionally, irrespective of the nationality of the patentee of other person working the invention.
>
> *"Question No. 2: Independence of Patents.* The question here is whether the principle of full independence embodied in Article 4*bis* of the Paris Convention should be maintained, or whether exceptions to it should be allowed, particularly where the foreign applicant in the developing country claims priority of an earlier foreign application on which no patent was issued because of lack of patentability or where the patent so granted was later invalidated for that reason. Furthermore, the question should be studied how decisions taken in respect of an invention in any foreign country could be made available to the national office of any developing country in which an application for that invention had been filed.
>
> *"Questions Nos. 3 to 5: Non-Working and Delays in Working of the Patented Invention; Compulsory Licenses; Licenses of Right.* The questions here are whether any developing country should not be permitted to impose requirements for working the patented invention which are more stringent for foreigners than nationals, whether the time limits in Article 5A of the Paris Convention should not be shortened, whether licenses of right—whose concept still required precise definition—should not be allowed by the Paris Convention and whether it should not be specified that importation did not satisfy the requirement of working in the country.
>
> *"Question No. 6: Preferential Treatment Without Reciprocity.* The question here is whether in certain respects nationals of developing countries should not re-

*The Delegation of Canada reserved its position as to this conclusion, and generally as to the possibilities of enlarging any proposed amendments which were appropriate for both developed and developing countries, so as to make them of universal application. The Director General indicated that amendments of benefit to all members States could be so enlarged.

ceive more favorable treatment in developed countries than nationals of the developed countries. One example was mentioned, that is, the fees to be paid: whether the amount of the fees charged for the application for, and maintenance of, a patent in a developed country should not be less than the fees to be paid by the nationals of countries which are not developing countries.

"Question No. 7: Technical Assistance. The question here is whether the Paris Convention should not contain provisions—similar, for example, to those contained in the Patent Cooperation Treaty—concerning technical assistance to developing countries. It was noted that under Article 7 of the Convention Establishing the World Intellectual Property Organization the institutional framework for such technical assistance existed but that budgetary considerations might militate in favor of including provisions on technical assistance also in the Paris Convention. It was suggested that Article 19 could be made use of in order to establish special unions devoted to technical assistance.

"Question No. 8: Types of Protection Other than Patents (Inventors' Certificates, etc.). The most important question here is whether inventors' certificates should not, as far as their legal nature so permits, be treated in the Paris Convention on an equal footing with patents and, consequently, expressly referred to in Article 1 and all other relevant provisions of that Convention. It was mentioned in this connection that the free choice, for foreigners on the same terms as for nationals, between patents and inventors' certificates would have to be consequently generalized. A further question here is whether inventors' certificates granted for industrial designs rather than technical inventions should also be expressly mentioned. Finally, the question of the inclusion in the text of the Paris Convention of references to special types of patents should be examined.

"Question No. 9: Marks; Industrial Designs; Appellations of Origin. Examples mentioned of questions to be considered here were: whether a more precise definition of the time limit mentioned in Article 5C(1) of the Paris Convention was not required in order to ensure early enforcement of any use requirements; whether the prohibition of the use of geographical designations as trademarks should not be established or, to the extent that it existed, reinforced; whether the protection of appellations of origin should not be reinforced and, in cases of conflict between an appellation of origin and a trademark, the former should not prevail; whether the protection against false indications of source and unfair competition in general should not be strengthened to allow for swifter action against abuses; whether the obligation to protect any well-known mark (*marque notoirement connue*) was always compatible with the interests of developing countries in which similar national marks were registered before the registration of the well-known mark; whether the possibility of providing for compulsory licenses for trademarks and industrial designs, in certain well-defined cases, should not be provided for; whether Article 6 of the Paris Convention concerning the indepedence of trademarks need not be revised; finally, whether the possibility of pronouncing the lapse of industrial designs, in certain well-defined cases, should not be provided for.

"Question 10: Reservations. The question here is whether any exception from the obligations of the Paris Convention allowed for developing countries should not be exercisable by way of a reservation to the relevant provision of that Convention. This could allow of a more flexible system, tailor-made for the needs of the country making reservations.

"Question No. 11: Deletion of Article 24. The question here is whether Article 24 of the Paris Convention has not become anachronistic and should not be deleted.

"Question No. 12: Scope of Protection of Process Patents. The question here is whether developing countries should not be exempted from the rule embodied in Article 5*quater* of the Paris Convention according to which the patentee has, with regard to imported products, all the rights which the process patent grants to him with respect to products manufactured in the country.

"Question No. 13: Right of Priority. All aspects of Article 4 of the Paris Convention should be examined, including the question whether the duration of the right of priority should not be longer for applicants who are nationals of developing countries when they apply for patents in developed countries.

"B. *Question of Procedure*

"Question No. 14: Unanimity Rule. The question here is to weigh the relative advantages and disadvantages of amending the Paris Convention by unanimity or a qualified majority."

These narrative synopses will form the basis for the study which the Director General will undertake as specified in paragraph 2(*a*) of the resolution. Following completion of the Director General's study, the report he prepares will be circulated to all member countries of the UN system of organizations for their comments and following receipt of these a second meeting of the Ad Hoc Group of Governmental Experts Concerning the Revision of the Paris Convention will be called. This may take place in the Spring of 1976.

[935 O.G. TM 71 (June 10, 1975)]

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(341) TRADEMARK REGISTRATION TREATY POST CONFERENCE INFORMATION

The text of the Trademark Registration Treaty (TRT), signed in 1973 for the United States and thirteen other States, was reproduced in the OFFICIAL GAZETTE of July 24, 1973. Other documents and materials concerning the treaty were published in the OFFICIAL GAZETTES of March 12, 1974, May 28, 1974, and October 14, 1974.

The World Intellectual Property Organization (WIPO) has now circulated an additional post conference document, which contains a catchword index to the articles and rules of the Trademark Registration Treaty.

In the belief that this index is not of such general interest as those which were previously published, and in lieu of its publication herein, the Office will supply a photocopy of the catchword index (TRT/PDC/7, dated April 25, 1975) to any interested person who may request such copy.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: May 23, 1975.

[935 O.G. TM 152 (June 17, 1975)]

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(342) MAIL DELAYS AND CONDITIONAL PETITIONS TO REVIVE (TRADEMARKS)

In view of the "Post Office to Addressee" express mail service offered by the U.S. Postal Service, the conditional petition practice as to trademarks, announced in the OFFICIAL GAZETTE (921 O.G. TM 126), is hereby extended to cover this type of service.

Where the addressee is the Patent and Trademark Office, this service provides for the delivery of mail to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C. 20231, no later than 3:00 p.m. on the next workday following its deposit before 5:00 p.m. at any postal facility in the United States with an Express Mail window.

It is suggested that when a communication, complying with the circumstances enumerated below, is mailed to the Patent and Trademark Office by means of the "Post Office to Addressee" express mail service and the communication is deposited at a U.S. Postal Service-Express Mail window by 5:00 p.m. on a day which is at least the day preceding the due date, a conditional petition be attached to the communication.

If the communication is received in the Patent and Trademark Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee, and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his attorney stating that the communication and petition were deposited at an

Express Mail window no later than 5:00 p.m. on a day which is at least the day preceding the due date, and were requested to be mailed via the "Post Office to Addressee" Express Mail Service. Since mail handled in this manner may reasonably be expected to reach the Patent and Trademark Office no later than 3:00 p.m. of the next workday following its deposit at an Express Mail window, any mail delays beyond such time will be considered to constitute unavoidable delay to grant a petition to revive (Section 12(b) of the Trademark Act of 1946).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent and Trademark Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action which places application in condition for publication or issue.
3. A notice of appeal and requisite fee.
4. An appeal brief.

Normal petition practices are not affected in those situations where this procedure is either not elected or not appropriate, nor does this procedure bar the granting of a petition in different fact situations where justified.

A suggested declaration form for the conditional petition is shown below:

Applicant:
Serial No.: Petition to Revive
Date Filed:
Mark:

I hereby declare that the attached communication is being deposited at an Express Mail window in a U.S. Postal Service's facility and intended to be mailed using the U.S. Postal Service's "Post Office to Addressee" Express Mail service in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, prior to 5:00 p.m. on _____, which date is at least the day preceding the due date, at _____, by
(Location)
_____
(Name of Individual)

In the event that such communication is not timely filed in the Patent and Trademark Office, it is requested that this paper be treated as a petition and that the delay in prosecution be held unavoidable.

The petition fee is authorized to be charged to Deposit Account No. _____ in the name of _____

The undersigned declares further that all statements made herein are true, based upon the best available information; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any registration resulting therefrom.

Date _____ _____
(Signature of applicant or applicant's attorney)
And
Date _____ _____
(Signature of person mailing, if other than the above)

June 24, 1975.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[936 O.G. TM 288 (July 29, 1975)]

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(343) REVISION OF FORM PARAGRAPHS AND OF FIRST ACTION FORMS FOR TRADEMARK APPLICATIONS

The Patent and Trademark Office has concluded its first review and revision of those form paragraphs used in trademark application actions (see 912 O.G. T.M. 310 for further information on the use of these paragraphs). The revision includes new paragraphs on points not previously covered as well as changes to existing paragraphs for clarification and simplification. Additionally, the Trademark Manual of Examining Procedure has been referenced where appropriate.

The revision was implemented in April 1975. A copy of the paragraphs may be obtained by addressing the Commissioner of Patents & Trademarks, Washington, D.C., 20231, Attention: Office of the Director of the Trademark Examining Operation.

The Office has also reviewed and revised the format of the one-page first action letter which contains check-off boxes for refusals, informalities, and notice of publication. Use of the revised letter will begin about September 1975 upon exhaustion of supplies of the previous form.

BERNARD A. MEANY,
Sept. 5, 1975. *Assistant Commissioner for Trademarks.*

[939 O.G. TM 104 (Oct. 14, 1975)]

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(344) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES
PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Revision of Administrative Fees

On August 21, 1975, notice of proposed rulemaking was published in the FEDERAL REGISTER (40 FR 36573), regarding the proposal of the Patent and Trademark Office to amend Title 37 of the Code of Federal Regulations by amending §§ 1.21, 1.25, 1.165, and 2.6 dealing with administrative fees. Interested persons were given until October 15, 1975, to submit written comments and suggestions. Full and careful consideration was given to the single written comment received.

Amendment of §§ 1.21 and 2.6 is intended to (1) recover increases in material and labor costs for furnishing assignment information, drafting services and classification information, (2) eliminate established fees for drafting services not currently in demand, and (3) establish a new fee. Drafting services for which established fees are eliminated (§ 1.21 (l) and (m)) will be furnished, if requested, at fees based upon actual cost. The new fee is established to recover the cost of servicing deposit accounts. The amendment of §§ 1.25 and 1.165 brings these rules into conformity with the amendment of § 1.21.

In consideration of the comment received, and pursuant to the authority contained in Section 6 of the Act of July 1952, as amended (85 Stat. 364, 35 U.S.C. 6), Parts 1 and 2 of Title 37, Code of Federal Regulations, are hereby amended as set forth below.

* * * * *

4. In § 2.6, paragraphs (a), (d) and (e) are revised and a new paragraph (f) is added to read as follows:

§ 2.6 *Trademark fees.*

* * * * *

(a) For each printed copy of a registration with data entered of record as of date of mailing, relating to renewal, cancellation, publication under section 12 (c), of the 1946 Trademark Act and affidavits or declarations under sections 8 and 15 of such act.

Omitting title	1.70
Showing title	3.70

* * * * *

(d) For making drawings, when facilities are available, the cost of making the same,

Rate per hour	12.00
Minimum charge per sheet	10.00

(e) for correcting drawings, the cost of making the correction:

Rate per hour (including a photoprint of the uncorrected drawing)	12.00
Minimum charge	3.00

(f) for abstracts of title to each registration or application:

For the search, one hour or less, and certificate	5.00
Each additional hour or fraction thereof	2.50
For each brief from the digest of assignments, of 200 words or less	2.00
Each additional 100 words or fraction thereof	.20

* * * * *

Effective Date: These revisions shall become effective February 2, 1976.

Dated: Dec. 4, 1975

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

DAVID B. CHANG,
Acting Assistant Secretary for Science and Technology.

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[942 TM 177 (Jan. 6, 1976)]

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(345) CERTIFICATE OF MAILING OF CORRESPONDENCE

Increasing problems caused by delays in the delivery of papers to the Office by mail within the time periods set for response by applicants have caused renewed efforts within and outside the Patent and Trademark Office to seek a suitable solution. Helpful suggestions have been received from a number of individuals and bar associations. The following proposal, which is hereby published for comment by all interested parties, appears to provide a simple and effective method of alleviating most of the problems resulting from mail delays and to be within the present statutory authority of the Commissioner.

The proposed practice on which comments are invited would provide that correspondence in pending applications and proceedings would be timely if (1) deposited in the mails within the period or time set by the Office, and (2) accompanied by a suitable declaration.

The present practice of treating a response or other correspondence as effective only upon actual receipt in the Patent and Trademark Office follows a decision by Commissioner Moore in *In re James*, 1913 C.D. 89. At that time the period for response to an Office action was one year, in contrast to the three month shortened statutory period which is usual today. Nothing in the statute appears to prevent the adoption of a different practice which takes into account the difficulties currently arising from shortened periods for response and uncertainties of the mails.

It is proposed that this change in practice be accomplished by Commissioner's notice rather than by changing the Rules of Practice (Title 37 of the Code of Federal Regulations). Comments are, however, also invited as to whether it would be preferable to adopt the proposed practice by rule change.

The proposed practice would not be applicable to the filing of patent or trademark applications. These are excluded because of the priority rights, domestic and international, which are involved.

The proposal contemplates the issuance of an Official Gazette Notice stating that:

Effective ----------, in any case where a time is set for taking action relative to any pending patent or trademark application or in any patent or trademark proceeding pending before the Patent and Trademark Office, correspondence will be considered as having been timely filed if it is

(1) deposited prior to the expiration of the period set for response (a) with the United States Postal Service as first class mail or (b) outside the United States with a governmental postal service as air mail, in an envelope addressed to the "Commissioner of Patents and Trademarks, Washington, D.C. 20231," and

(2) accompanied by a statement in the form of a declaration under 37 CFR 1.68 indicating the name of the person depositing the correspondence in the mail, the location of the deposit in the mail, and date of deposit in the mail.

In the event that correspondence is mailed and the application is later held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice because such correspondence was not received in the Patent and Trademark Office, the correspondence will be considered timely and the Office action will be vacated if the party who forwarded such correspondence, promptly after becoming aware of the Office action, informs the Office of the previous mailing of the correspondence, supplies an additional copy of the previously mailed correspondence and declaration of mailing, and includes a new declaration which attests again to the previous mailing of the correspondence and declaration.

A suggested format for the declaration under 37 CFR 1.68 to be included on the first page of any correspondence is shown below:

I hereby certify that this correspondence is being deposited with:

☐ the United States Postal Service as first class mail

☐ a governmental postal service other than the United States Postal Service as air mail

in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ----------
Date

from ----------
Location of mailing (deposit in the mail)

by ----------
Name of person actually depositing the correspondence in the mail

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date ---------- ----------
Signature of applicant or assignee, or signature and Registration Number of Registered Representative

* * * * *

Any person wishing to comment upon the proposed practice should address the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Comments should be received by March 16, 1976.

C. MARSHALL DANN,
Dec. 23, 1975. *Commissioner of Patents and Trademarks.*

[942 O.G. TM 359 (Jan. 20, 1976)]

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(346) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

PART 4—FORMS FOR TRADEMARK CASES

Revised Rules and Procedures

On February 11, 1975, a notice of proposed rulemaking was published in the Federal Register (40 FR 6361) regarding the proposal by the Patent and Trademark Office to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.12, 1.136, 1.197, 1.244, 1.256, 1.304, 2.18, 2.37, 2.75, 2.80, 2.85, 2.101, 2.102, 2.103, 2.105, 2.111, 2.112, 2,120, 2.123, 2.127, 2.129, 2.141, 2.144, 2.145, 2.162, 2.172, 2.183, 2.185, 2.187, and 4.2. Interested persons were given until May 1, 1975, to submit written comments and suggestions. Full and careful consideration was given to all written comments submitted and some changes in the original proposal have been made in view thereof.

Amendments are also now being made in sections which were not included in the published proposal, namely, §§ 2.11, 2.14, 2.15, 2.19, 2.93, 2.99, 2.113, 2.119, and 2.161; and section 4.3 is being deleted. Since these amendments are in accord with changes as to related matters in other sections which were contained in the published proposal, notice and public procedures thereon are deemed unnecessary.

The additional amendments, as well as changes from the text of the sections as published in the original proposal, are described below:

Paragraph (b) of § 1.197, paragraph (b) of § 1.256, paragraph (c) of § 2.129 and § 2.144 are being revised to include the name of the Board which may grant extension of time for requesting rehearing or reconsideration of a decision, that is, the Board of Appeals, the Board of Patent Interferences, or the Trademark Trial and Appeal Board.

Paragraph (a) of §1.304 (second sentence) and paragraph (d)(1) of § 2.145 (second sentence) are being revised to state more clearly that the time for filing a request for rehearing or reconsideration is determined under § 1.197(b) or § 1.256(b) in patent cases and § 2.129(c) or section 2.144 in trademark cases. These paragraphs are also being revised to make clear that if a request for rehearing or reconsideration, or modification of a decision, is acted on less than thirty days after the date of the decision, an appeal may still be filed or a civil action commenced within the original sixty-day period.

As to representation and powers of attorney, § 4.2 is being revised to state that individuals must be appointed in a power of attorney in order for the document to be regarded as a power, and §4.3, which is a form for the authorization of an agent, is being cancelled because normally persons who are recognized to practice before the Patent and Trademark Office in trademark cases are not designated as agents (see § 2.12). The form is outmoded and inaccurate, and in view of the relatively small amount of use which will probably be made of a form for authorizing representation by a person who is not an attorney, it is not believed necessary to provide a form for that purpose. In line with this change, the wording as to "agent" where it appears in either existing or proposed §§ 2.11, 2.14(c), 2.15, 2.18, 2.19, 2,93, 2,99(a) and (b), 2.102(a), 2.103, 2.113, 2.119(a) and (b) 2.123(e)(2), and 2.129(b), is being changed to "other authorized representative" or equivalent language, as appropriate.

In § 2.75 the word "effective" is being added to the second sentence in describing the original filing date.

In paragraph (e) of § 2.85, the clause which refers to the fee being less than the required amount because "a multiple class application or registration is" involved, is being reworded, for greater accuracy, to refer to the fee being less than the required amount because "multiple classes in an application or registration are" involved. At the end of the paragraph, the following is being added: ", or if action is sought only for the number of classes equal to the number of fees submitted," the purpose of this addition being to make it clear that action may be taken as to less than all of the classes in a multiple class application or registration. In this connection, see also revised § 2,172. In paragraph (e) of § 2.85 the word "Examiner" is being changed to "Office" because the notification referred to is not necessarily handled by an examiner.

In § 2.101 wording is being added to make it clear that an opposition may be filed within an extension of time for filing opposition as well as within thirty days after publication of the mark. Also, the wording "Two or more persons may be joined" is being changed to "If persons are joined," since whether or not persons are properly joined is subject to review by the Trademark Trial and Appeal Board.

In paragraph (b) of § 2.102, the word "written" is being inserted before "request to extend the time" in the first sentence. Also, reference to a time for filing a showing of cause has been deleted as being superfluous. These modifications accord with Pub. L. 93–600, enacted January 2, 1975.

In § 2.103 the words "such filing" have been modified to read "the filing of such opposition" in order to assure the clarity of the meaning.

In addition, §§ 2.101, 2.102, and 2.103 taken as a unit are being reorganized to place topics in better sequence and to consolidate references to each topic in one place. This reorganization is for the purpose of clarity and does not make any change in substance.

The division of § 2.111 into paragraphs (a) and (b) has been eliminated, proposed paragraph (b) relating to insufficient fees being incorporated in the body of the section. The last sentence in proposed § 2.112 relating to insufficient fees has been deleted as being repetitious of § 2.111.

A sentence is being added at the end of section 2.112 indicating that a fee for each person for each class is required if persons are joined in a petition to cancel.

The pertinent wording in each of §§ 2.101, 2.102, 2.103, 2.111, 2.112, 2.141, 2.161, 2.162, and 2.183 is being changed to indicate more plainly that action may be taken on less than the total number of classes in an application or registration, and that in that event the particular class or classes for action should be specified. The pertinent wording in such sections has also been modified to state that action should "include" the appropriate number of fees rather than "be accompanied by" such fees, in order to accord with the present practice of accepting a fee if it is received within the prescribed period even though it may not physically accompany the action.

Section 2.113 is being revised to change the word "notice" to "notification." In section 2.112 the word "notice" in the first sentence is likewise being changed to "notification." These changes accord with the equivalent change made in § 2.105 in the published proposal. The purpose is to make it clear that the paper which is prepared under these sections is merely a notification of the existence of a cancellation proceeding which commenced when a petition which is correct as to form was filed. The last word of paragraph (b) of § 2.113 is being changed from "registrant" to "respondent party" to agree with cancellation § 2.112.

Paragraph (c) in § 2.120 is being modified to provide that a written statement by the attorney for the moving party, rather than an affidavit or declaration, is sufficient in support of a motion for an order to compel discovery, and that if issues raised by the motion have been subsequently resolved, the attorney should merely advise the Trademark Trial and Appeal Board in writing of the matters which no longer require decision by the Board.

In § 2,162, the wording of paragraph (e) is being modified to indicate that the sixth year affidavit must state that the mark is in use except when there is excusable nonuse under paragraph (f) of such section. The wording of such paragraph also is being expanded to make clear the present practice that the specimen submitted with the sixth year affidavit be a specimen currently in use. In both paragraphs (e) and (f), in the second sentences, the second occurrence of the words "may be" is being deleted as unnecessarily repetitious.

In § 2.172, the proposed third sentence is being reworded to simplify the language, and at the end of the proposed fourth sentence the specific number (2.173) of the section referred to in the sentence is being added.

In § 2.183 the wording of paragraph (a) is being modified to indicate that the renewal application must state that the mark is still in use in commerce except when there is excusable nonuse under paragraph (c) of such section. In the last sentence of paragraph (c), the words "in order to show excusable nonuse" are being added after the word "explanation" for greater clarity, and in the same sentence the second occurrence of the words "may be" is being deleted as unnecessarily repetitious.

Section 2.187 is being reworded to make clear that not only is it permissible for a certificate of registration to issue to an assignee or in a new name of applicant, but that the certificate will be so issued whenever the Office knows of such situation in time to do so. Section 2.187 is being further reworded to clarify that for a certificate of registration to issue to an assignee or in a new name of applicant, the supporting document must be actually recorded by the time indicated; further, if the document is not actually recorded by such time, a statement placed in the application file by the time specified will accomplish the same result. Also added to § 2.187 is the statement that the address of the assignee may be provided by being placed in the recorded document.

In consideration of the comments received and pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949), and in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 94–132, 85 Stat. 364) and amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949), Parts 1 and 2 of Chapter I of Title 37 of the Code of Federal Regulations are hereby revised or amended, as follows:

1. Section 1.12 is revised to read as follows:

§ 1.12. *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, and assignment records relating to pending or abandoned trademark applications

and to trademark registrations, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned patent application are not available to the public. Copies of any such patent assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such patent application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

2. In § 1.136, paragraph (b) is revised. As amended, § 1.136 reads as follows:

§ 1.136 *Time less than six months.*

* * * * *

(b) The time for reply, when a time less than six months has been set, will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. Only one extension may be granted by the primary examiner in his discretion; any further extension must be approved by the Commissioner. In no case can any extension carry the date on which response to an action is due beyond six months from the date of the action.

3. In § 1.197, paragraph (b) is revised. As amended, § 1.197 reads as follows:

§ 1.197 *Action following decision.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states. Such time may be extended by the Board of Appeals upon a showing of sufficient cause.

* * * * *

4. In § 1.244, paragraph (c) is revised. As amended, § 1.244 reads as follows:

§ 1.244 *Motions; miscellaneous provisions.*

* * * * *

(c) Any request for rehearing or reconsideration, or modification of the decision, must be filed within twenty days after the date of the decision, and any reply thereto shall be filed within twenty days from the date of service of the request.

* * * * *

5. In § 1.256, paragraph (b) is revised. As amended, § 1.256 reads as follows:

§ 1.256 *Final hearing.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Interferences so states. Any reply thereto shall be filed within fifteen days from the date of service of the request. The times specified herein may be extended by the Board of Patent Interferences upon a showing of sufficient cause. (See § 1.304.)

6. Section 1.304 is revised to read as follows:

§ 1.304 *Time for appeal or civil action.*

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Customs and Patent Appeals (section 1.302) or for commencing a civil action (section 1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in section 1.197(b) or 1.256 (b), or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

(b) The times specified herein are calendar days. If the last day of the time specified for appeal or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under 35 U.S.C. 141 that he elects to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141.

7. Section 2.11 is revised to read as follows:

§ 2.11 *Applicants may be represented by an attorney.*

The owner of a trademark may file and prosecute his own application for registration of such trademark, or he may be represented by an attorney or other person authorized to practice in trademark cases. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

8. In § 2.14, paragraph (c) is revised. As amended, § 2.14 reads as follows:

§ 2.14 *Advertising.*

* * * * *

(c) No person not an attorney, solicitor or lawyer shall, in any material specified in paragraph (b) of this section or in papers filed in the Patent and Trademark Office, represent himself to be an attorney, solicitor or lawyer.

9. Section 2.15 is revised to read as follows:

§ 2.15 *Signature and certificate of attorney or other representative.*

Every paper filed by an attorney at law or other person representing an applicant or party to a proceeding in the Patent or Trademark Office must bear the signature of such attorney at law or other person except those papers which are required to be signed by the applicant or party. The signature of an attorney at law or such other person to a paper filed by him, or the filing of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief there is good ground to support it; and that it is not interposed for delay.

10. Section 2.18 is revised to read as follows:

§ 2.18 *Correspondence, with whom held.*

Correspondence will be sent to the applicant or a party to a proceeding at his address unless papers are transmitted by an attorney at law, or a written power of attorney is filed, or written authorization of other person entitled to be recognized is filed, or the applicant or party designates in writing another address to which correspondence is to be sent, in which event correspondence will be sent to the attorney at law transmiting the papers, or to the attorney at law designated in the power of attorney, or to the other person designated in the written authorization, or to the address designated by the applicant or party for correspondence. Correspondence will continue to be sent to such address until the applicant or party, or the attorney at law or other authorized representative of the applicant or party, indicates in writing that correspondence is to be sent to another address. Double correspondence will not be undertaken by the Patent and Trademark Office, and if more than one attorney at law or other authorized representative appears or signs a paper, the Office reply thereto will be sent to the address already established in the file until another correspondence address is specified by the applicant or party or by the attorney or other authorized representative of the applicant or party.

11. Section 2.19 is revised to read as follows:

§ 2.19 *Revocation of power of attorney or of other authorization to represent.*

Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of

a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his authorization.

12. Section 2.37 is revised to read as follows:

§ 2.37 *Authorization for representation; U.S. representative.*

The authorization of a qualified person to represent applicant (section 2.17(b)) and the designation of a domestic representative (section 2.24) may be included as a paragraph or paragraphs in the application.

13. Section 2.75 is revised to read as follows:

§ 2.75 *Amendment to change application to different register.*

An application for registration on the Principal Register may be changed to an application for registration on the Supplemental Register and vice versa by amending the application to comply with the rules relating to the requirements for registration on the appropriate register, as the case may be. The original filing date may be considered the effective filing date for the purpose of proceedings in the Patent and Trademark Office provided the application as originally filed was sufficient for registration on the register to which amended. Otherwise, the filing date of the amendment will be considered the effective filing date of the application so amended.

14. Section 2.80 is revised to read as follows:

§ 2.80 *Publication for opposition.*

If, on examination or reexamination of an application for registration on the Principal Register, it appears that the applicant is entitled to have his mark registered, the mark will be published in the OFFICIAL GAZETTE for opposition. The mark will also be published in the case of an application to be placed in interference or concurrent use proceedings, if otherwise registrable.

15. In § 2.85, paragraph (e) is revised. As amended, § 2.85 reads as follows:

§ 2.85 *Classification schedules.*

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(e) Where the amount of the fee received on filing an appeal in connection with an application or on filing an affidavit under section 8(a) or 8(b) or on an application for renewal or in connection with an opposition or petition for cancellation is sufficient for at least one class of goods or services but is less than the required amount because multiple classes in an application or registration are involved, the appeal or the affidavit or renewal application or opposition or petition for cancellation will not be refused on the ground that the amount of the fee was insufficient if the required additional amount of the fee is received in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office, or if action is sought only for the number of classes equal to the number of fees submitted.

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16. Section 2.93 is revised to read as follows:

§ 2.93 *Declaration of interference.*

An interference is declared and instituted by the mailing of a notice of interference to the parties. The notice shall be sent to each applicant, in care of his attorney or other representative of reord, if any, and if one of the parties is a registrant, the notice shall be sent to him or his assignee of record. The notice shall give the name and address of the adverse party and of his attorney or other authorized representative, if any, together with the serial number and date of filing and publication, if published, of each of the applications or registrations involved.

17. In § 2.99, paragraphs (a) and (b) are revised. As amended, § 2.99 reads as follows:

§ 2.99 *Application to register as concurrent user.*

(a) An application for registration as a lawful concurrent user will be examined in the same manner as other applications for registration. When it is determined that the mark is ready for publication or allowance, except for questions relating to concurrent registration, the applicant may be required to furnish as many copies of his written application, specimens and drawing, as may be necessary. The Examiner of Trademarks shall prepare notices for the applicant and for each applicant, registrant, or user specified in the application for registration as a concurrent user. Such notices for the specified parties shall give the name and address of the applicant and of his attorney or other authorized representative, if any, together with the serial number and filing date of the application.

(b) The notices shall be sent to each of the parties, in care of their attorneys or other representatives, if they have attorneys or other representatives of record, and if one of the parties is a registrant, a notice shall also be sent to him or his assignee of record. A copy of the application shall be forwarded with the notices to the parties specified in the application. An answer to the notice is not required in the case of an applicant or registrant whose application or registration is specified in the application to register as concurrent user but a statement, if desired, may be filed within forty days after the mailing of the notice; in the case of other parties specified in th application to register as concurrent user, answer must be filed within forty days after the mailing of the notice.

• • • • •

18. Section 2.101 is revised to read as follows:

§ 2.101 *Filing an opposition.*

(a) Any person who believes that he would be damaged by the registration of a mark upon the Principal Register may oppose the same by filing an opposition in the Patent and Trademark Office within thirty days after publication of the mark sought to be registered (§ 2.80), or within an extension of the time for filing an opposition (§ 2.102). The opposition must be verified, or include a declaration in accordance with § 2.20, unless the opposition is filed by an attorney at law or other authorized representative in accordance with § 2.103.

(b) An opposition must include the required fee for each class sought to be opposed in the application. If fees insufficient to cover all classes in the application are submitted, the particular class or classes in which opposition is sought should be specified. If persons are jointed in an opposition, a fee for each class sought to be opposed in the application for each person so joined is required.

19. Section 2.102 is revised to read as follows:

§ 2.102 *Extension of time for filing opposition.*

(a) A request to extend the time for filing an opposition must be made by a person who believes that he would be damaged by the registration of the mark on the Principal Register, but an attorney at law or other person authorized to represent a party may file the request on behalf of a potential opposer. The potential opposer must be identified with reasonable certainty in the request. Any opposition filed during an extension of time should be in the name of the person to whom the extension was granted, but an opposition may be accepted if the person to whom the extension was granted was misidentified through mistake, or an opposition filed in a different name may be accepted if the person filing the opposition is in privity with the person to whom the extension was granted.

(b) A written request to extend the time for filing an opposition must be received in the Patent and Trademark Office before the expiration of thirty days from the date of publication, and should specify the period of extension desired. A first extension of time will be granted upon request if the extension is for not more than thirty days. Other extensions of time may be granted by the Commissioner for good cause.

20. Section 2.103 is revised to read as follows:

§ 2.103 *Opposition filed by attorney at law or other authorized representative.*

An opposition may be filed in the Patent and Trademark Office by an attorney at law or other person authorized to represent a party, either within thirty days after publication of the mark sought to be registered (§ 2.80), or within an extension of the time for filing an opposition (§ 2.102), but the opposition will be null and void unless confirmed by the opposer by verification, or by declaration in accordance with § 2.20, within thirty days after the filing of the opposition, or within such further time as may be fixed by the Commissioner upon request made before the expiration of the thirty days.

21. Section 2.105 is revised to read as follows:

§ 2.105 *Notification of opposition proceedings.*

A notification of an opposition which has been regularly filed shall be prepared, identifying the title and number of the proceeding and the application involved, and designating a time, not less than thirty days from the mailing date of such notification, within which answer must be filed. Copies of this notification shall be forwarded by the Trademark Trial and Appeal Board to the parties in care of their attorneys or other representatives, if they have attorneys or other representatives of record. The duplicate copy of the opposition and exhibits shall be forwarded with the notification to the applicant.

22. Section 2.111 is revised to read as follows:

§ 2.111 *Time for filing petition for cancellation.*

Any person who believes that he is or will be damaged by a registrant may, upon payment of the required fee for each class sought to be cancelled in the registration, apply to the Commissioner to cancel said registration as to the specified class or classes. A petition to cancel which includes insufficient fees to over all classes in the registration should specify the partiular class or classes for which cancellation is sought. Such petition may be made at any time in the case of registrations on the Supplemental Register or under the act of 1920, or registrations under the act of 1881 or the act of 1905 which have not been published under section 12(c) of the act (§ 2.153), and in cases involving the grounds specified in section 14(c), (d) and (e) of the act. In all other cases such petition must be made within five years from the date of registration of the mark under the act of 1946 or from the date of publication under section 12(c) of the act.

23. Section 2.112 is revised to read as follows:

§ 2.112 *Petition for cancellation.*

The petition to cancel, which must be verified, or include a declaration in accordance with § 2.20, must set forth a short and plain statement showing how the petitioner is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notification shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition. Applications to cancel different registrations owned by the same party may be joined in one petition when appropriate, but the required fee must be included for each class sought to be cancelled in each registration against which each application to cancel is filed. If persons are joined in a petition to cancel, a fee for each class sought to be cancelled for each person so joined is required.

24. In § 2.113, paragraph (b) and the title are revised. As amended, § 2.113 reads as follows:

§ 2.113 *Notification of filing of petition.*

* * * * *

(b) When the petition is correct as to form, a notification shall be prepared, identifying the title and number of the proceeding and the registration involved, and designating a time, not less than thirty days from the mailing date of such notification, within which answer must be filed. A copy of this notification shall be forwarded to the petitioner in care of his attorney or other representative, if he has an attorney or other representative of record. The duplicate copy of the petition and exhibits shall be forwarded with a copy of such notification to the respondent party.

25. In § 2.119, paragraphs (a) and (b) are revised. As amended, §2.119 reads as follows:

§ 2.119 *Service of papers.*

(a) Every paper filed in the Patent and Trademark Office in inter partes cases, including notice of appeal, must be served upon the other parties except the notice of interference (§ 2.93), the notification of opposition (§ 2.105), the petition for cancellation (§ 2.113), and the notice of a concurrent use proceeding (§ 2.99), which are mailed by the Patent and Trademark Office. Proof of such service must be made before the paper will be considered by the Office. A statement signed by the attorney or other authorized representative, attached to or appearing on he original paper when filed, clearly stating the date and manner in which service was made will be accepted as prima facie proof of service.

(b) Service of papers must be on the attorney or other authorized representative of the party if there be such or on the party if there is no attorney or other authorized representative, and may be made in either of the following ways: (1) By delivering a copy of the paper to the person served; (2) by leaving a copy at the usual place of business of the person served, with someone in his employment; (3) when the person served has no usual place of business, by leaving a copy at his residence, with a member of his family over 14 years of age and of discretion; (4) transmission by first-class mail, which may also be certified or registered. Whenever it shall be satisfactorily shown to the Commissioner that none of the above modes of obtaining service or serving the paper is practicable, service may be by notice published in the OFFICIAL GAZETTE.

* * * * *

26. In § 2.120, paragraph (c) is revised. As amended, § 2.120 reads as follows:

§ 2.120 *Discovery procedure.*

* * * * *

(c) Failure to make discovery: Sanctions.

(1) If any party fails or refuses to answer any proper question in taking discovery depositions or fails or refuses to answer any proper question propounded by interrogatories or fails or refuses to comply with a request to produce and permit the inspection and copying of designated things, the party seeking discovery may file a motion with the Trademark Trial and Appeal Board for an order compelling discovery. Such a motion must be supported by a written statement by the attorney for the moving party that the moving party or its attorney has conferred with the opposing party or its attorney in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by the motion are subsequently resolved between the parties, the attorney for the moving party should advise the Trademark Trial and Appeal Board in writing of the matters in the motion which no longer require decision by the Board.

(2) If a party or an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Civil Procedure to testify on behalf of a party, fails to obey an order to provide or permit discovery, the Trademark Trial and Appeal Board may strike out all or any part of any pleading of that party, dismiss the action or proceeding, or deny any part thereof, enter judgment as by default against that party or take any such other action as may be deemed appropriate.

27. In § 2.123, paragraph (e)(2) is revised, and paragraph (g)(3) is added. As amended, § 2.123 reads as follows:

§ 2.123 *Trial testimony in inter partes cases.*

* * * * *

(e) * * *

(2) The deposition shall be taken in answer to questions, with the questions and answers recorded in their regular order by the officer, or by some other person (who shall be subject to the provisions of Rule 28 of the Federal Rules of Civil Procedure) in the presence of the officer except when his presence is waived on the record by agreement of the parties. The testimony shall be taken stenographically and transcribed, unless the parties present agree otherwise. In the absence of all opposing parties and their attorneys or other authorized representatives, depositions may be taken in longhand, typewriting, or stenographically.

* * * * *

(g) * * *

(3) Each deposition must contain an index of the names of the witnesses, giving the pages where their examination and cross-examination begin, and an index of the exhibits, briefly describing their nature and giving the pages at which they are introduced and offered in evidence.

* * * * *

28. In § 2.127, paragraph (b) is revised. At amended, § 2.127 reads as follows:

§ 2.127 *Motions.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of a decision, on a motion which is not finally dispositive of the case, must be filed within thirty days from

the date thereof. Any brief in opposition shall be filed within fifteen days after service of the request.

• • • • •

29. In § 2.129, paragraphs (b) and (c), and the title, are revised. As amended, § 2.129 reads as follows:

§ 2.129 *Oral argument, and reconsideration.*

• • • • •

(b) Hearings may be advanced or adjourned, as far as is convenient and proper to meet the wishes of the parties and their attorneys or other authorized representatives.

(c) Any request for rehearing or reconsideration, or modification of a decision, including a decision on a motion which is finally dispositive of a case, must be filed within thirty days from the date thereof. Any brief in opposition shall be filed within fifteen days after service of the request. The times specified herein may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

30. Section 2.141 is revised to read as follows:

§ 2.141 *Ex parte appeals from the Examiner of Trademarks.*

Every applicant for the registration of a mark may, upon final refusal by the Examiner of Trademarks, appeal to the Trademark Trial and Appeal Board upon payment of the prescribed fee for each class in the application for which an appeal is taken. An appeal which includes insufficient fees to cover all classes in the application should specify the particular class or classes in which an appeal is taken. A second refusal on the same grounds may be considered as final by the applicant for purpose of appeal.

31. Section 2.144 is revised to read as follows:

§ 2.144 *Reconsideration of decision on ex parte appeal.*

Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

32. In § 2.145, paragraphs (a), (b), and (d) are revised. As amended, § 2.145 reads as follows:

§ 2.145 *Appeal to court and civil action.*

(a) Appeal to U.S. Court of Customs and Patent Appeals. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under Section 8 of the act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Customs and Patent Appeals. The appellant must take the following steps in such an appeal: (1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section); (2) in the court, file a petition of appeal and a certified transcript of the record within a specified time after filing the appeal, and pay the fee for appeal, as provided by the rules of the court. The transcript will be transmitted to the Court by the Patent and Trademark Office on order of and at the expense of the appellant. Such order should be filed with the notice of appeal, but in no case should it be filed later than fifteen days thereafter.

(b) Notice of appeal.

(1) When an appeal is taken to the U.S. Court of Customs and Patent Appeals, the appellant shall give notice thereof in writing to the Commissioner, which notice shall be filed in the Patent and Trademark Office, within the time specified in paragraph (d) of this section. The notice shall specify the party or parties taking the appeal and shall designate the decision or part thereof appealed from.

(2) In inter partes proceedings, the notice must be served as provided in § 2.119.

• • • • •

(d) Time for appeal or civil action.

(1) The time for filing the notice of appeal to the U.S. Court of Customs and Patent Appeals (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in section 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

(2) The times specified herein are calendar days. If the last day of time specified for appeal, or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under section 21(a)(1) of the act that he elects to have all further proceedings conducted under section 21(b) of the act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the act.

33. Section 2.161 is revised to read as follows:

§ 2.161 *Cancellation for failure to file affidavit or declaration during sixth year.*

Any registration under the provisions of the act of 1946 and any registration published under the provisions of section 12(c) of the act (§ 2.153) shall be cancelled as to any class in the registration at the end of six years following the date of registration or the date of such publication, unless within one year next preceding the expiration of such six years the registrant shall file in the Patent and Trademark Office an affidavit or declaration in accordance with § 2.20 showing that said mark is still in use as to such class or showing that its non-use as to such class is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

34. Setion 2.162 is revised to read as follows:

§ 2.162 *Requirements for affidavit or declaration during sixth year.*

The affidavit or declaration required by § 2.161 must:

(a) Be executed by the registrant after expiration of the five-year period following the date of registration or of publication under section 12(c) of the act;

(b) Be filed in the Patent and Trademark Office before the expiration of the sixth year following the date of registration or of publication under section 12(c) of the act;

(c) Identify the certificate of registration by the registration number and date of registration;

(d) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified;

(e) State that the registered mark is in use (except under paragraph (f) of this section). The statement must be supported by evidence which shows that the mark is still in use, and normally such evidence consists of a specimen or a facsimile specimen which is currently in use, or a statement of facts concerning use. The supporting evidence should be submitted with the affidavit or declaration, but if it is not or if the evidence submitted is found to be deficient, the evidence, or further evidence, may be submitted and considered even though filed after the sixth year has expired;

(f) If the registered mark is not still in use, recite facts to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. If the facts recited are found not to be sufficient, further evidence or explanation may be submitted and considered even though filed after the sixth year has expired; and

(g) Contain the statement of use or statement as to nonuse and appropriate evidence in support thereof, as required in paragraphs (e) and (f) of this section, for each class to which the affidavit or declaration pertains in the registration.

35. Section 2.172 is revised to read as follows:

§ 2.172 *Surrender for cancellation.*

Upon application by the registrant, the Commissioner may permit any registration to be surrendered for cancellation. Application for such action must be signed by the registrant and must be accompanied by the original certificate of registration, if not lost or destroyed. When there is more than one class in a registration, one or more entire class but less than the total number of classes may be surrendered as to

the specified class or classes. Deletion of less than all of the goods or services in a single class constitutes amendment of registration as to that class (see § 2.173).

36. In § 2.183, paragraphs (a), (b), and (c) are revised. As amended, § 2.183 reads as follows:

§ 2.183 *Requirements for application for renewal.*

(a) The application for renewal must include a statement which is verified or which includes a declaration in accordance with § 2.20 by the registrant setting forth the goods or services recited in each class for which renewal is sought in the registration on or in connection with which the mark is still in use in commerce, specifying the nature of such commerce (except under paragraph (c) of this section). This statement must be executed not more than six months before the expiration of the registration and must:

(1) Be accompanied by a specimen or facsimile specimen for each class for whih renewal is sought in the registration showing current use of the mark.

(2) Include the required fee for each class for which renewal is sought in the registration, and an additional fee for each class in the case of a delayed application for renewal. If the application for renewal includes insufficient fees to over all classes in the registration, the particular class or classes for which renewal is sought should be specified.

(b) The declaration or verified statement, specimen or facsimile specimen and the fee for each class for which renewal is sought in the registration must be filed within the period prescribed for applying for renewal. If defective or insufficient, they cannot be completed after the period for applying for renewal has passed; if completed after the initial six month period has expired but before the expiration of the three month delay period, the application can be considered only as a delayed application for renewal.

(c) If the mark is not in use in commerce at the time of filing of the declaration or verified statement as to any class for which renewal is sought, facts must be recited to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. There must be a recitation of facts as to nonuse for each class for which renewal is sought or it must be clear that the facts recited apply to each class sought to be renewed. If the facts recited require amplification or explanation in order to show excusable nonuse, further evidence may be submitted and considered even though filed after the period for applying for renewal has passed.

* * * * *

37. In § 2.185, paragraphs (a)(2) and (a)(4) are revised. As amended, § 2.185 reads as follows:

§ 2.185 *Requirements for assignments.*

(a) Assignments under section 10 of the act of registered marks, or marks for which an application for registration has been filed, will be recorded in the Patent and Trademark Office. Other instruments which may relate to such marks may be recorded in the discretion of the Commissioner. No assignment will be recorded, except as may be ordered by the Commissioner, unless it has been executed and unless:

* * * * *

(2) It is in the English Language or, if not in the English language, accompanied by a translation signed by the translator;

* * * * *

(4) A designation of a domestic representative is made in case the assignee is not domiciled in the United States. The designation must be separate from the assignment and there must be a separate designation for each registration or application assigned in one instrument.

38. Section 2.187 is revised to read as follows:

§ 2.187 *Certificate of registration may issue to assignee.*

The certificate of registration may be issued to the assignee of the applicant, or in a new name of applicant, and certificate of registration will be so issued provided an appropriate document is of record in the Assignment Division of the Patent and Trademark Office no later than the time the notice of publication is mailed, or if such document is not of record, then if a statement that such document has been filed for recordation is in the application file by the time the application is being prepared for issuance of the certificate of registration. The address of the assignee must be made of record in the application file or in the recorded document.

39. Section 4.2 is revised to read as follows:

§ 4.2 *Power of attorney accompanying application.*

Applicant hereby appoints ---------- (8) ---------- to prosecute this application (address) to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE: (8) An individual must be appointed. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

§ 4.3 [*Removed*]

40. Section 4.3 is removed.

Effective date: These amendments become effective on February 1, 1976.

Dated: December 11, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: December 24, 1975.

DAVID B. CHANG,
Deputy Assistant Secretary for Science and Technology.

Published in 41 F.R. 756, Jan. 5, 1976

[943 O.G. TM 2 (Feb. 3, 1976)]

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(347) INTERNATIONAL TRADEMARK CLASSIFICATION

At its November 3–6, 1975 meeting, the Committee of Experts of the Nice Agreement decided to conduct a systematic overall review of the Classification. A working Group will consider all proposals for changes in the Classification submitted by the member countries and certain international and intergovernmental organizations. The entire review is expected to require 2 to 3 years. The Group's recommendations will then be submitted to the Committee of Experts which will determine the actual changes to be made. Concurrently, an Ad Hoc Committee will prepare a revision of the Nice Agreement, particularly with respect to Article 3(3), the unanimity rule.

Suggestions for changes were submitted to the Patent and Trademark Office last year when a general review of the Classification was first contemplated. Additional suggestions will be welcomed by the Office for consideration in the preparation of proposed changes to be submitted to the Committee of Experts. The Committee has requested that proposals be accompanied by an explanation of why the change is warranted. Suggestions should be sent, by March 5, 1976, to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of Legislation and International Affairs, Room 1108, CP–6

BERNARD A. MEANY,
Jan. 16, 1976. *Assistant Commissioner for Trademarks.*

[943 O.G. TM 135 (Feb. 17, 1976)]

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(348) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 4—FORMS FOR TRADEMARK CASES

Revised Trademark Forms

The Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations by revising §§ 4.1, 4.1a, 4.2, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, 4.21 and 4.22, which sections are suggested forms for trademark cases, and also revising the introductory note to the Forms for Trademark Cases.

These revisions conform the language of the forms, where necessary, to the changes in Part 2 of this Chapter which became effective on February 1, 1976, and also alter language in the forms which is incorrect or inconsistent. These revisions do not effect any changes in practice and do not impose a

burden on anyone, and therefore procedures for public comment are not deemed necessary.

The major revisions in the forms, aside from conformance of language to the present trademark rules, are described below:

A form of notarial jurat is included or incorporated by reference at the end of all verifications and affidavits. A form of acknowledgement is included at the end of the assignment of application form and the assignment of registration form.

A note is included to indicate where adjustment of a form is necessary to accommodate multiple classes or services.

Wording is included in section 4.2 to indicate that the form is for use only by attorneys at law and that submission of the form by attorneys at law is optional.

Notes to section 4.8 are included to explain how to use the form for collective membership marks in addition to collective trademarks and collective service marks.

The organization of section 4.13 (Application for renewal) has been changed to remove the statement as to use and the goods on which the mark is still in use from the verification portion of the form and to place the statements in the body of the application portion of the form.

A note is included, where appropriate, to indicate that when a domestic representative is required but is not designated when a document is filed, an unrevoked designation if one is already in the file will be regarded as the required designation.

Pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596; 88 Stat. 1949), and in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 92–132; 85 Stat. 364) and on January 2, 1975 (Pub. L. 93–596; 88 Stat. 1949), Part 4 of Chapter I of Title 37 of the Code of Federal Regulations is hereby revised, as follows:

NOTE: The following forms illustrate the manner of preparing applications for registration of marks as well as various other papers to be filed in the Patent and Trademark Office in trademark cases. Applicants and other parties will find their business facilitated by following them. These forms should be used in cases to which they are applicable. A sufficient number of representative forms are given which, with the variations indicated by the notes, should take care of all the usual situations. In special situations such alterations as the circumstances rendered necessary may be made provided they do not depart from the requirements of Part 2 of this Chapter or of the trademark statute. Before using any forms, the pertinent requirements of Part 2 of this Chapter and the pertinent sections of the trademark statute should be studied carefully.

In using these forms, the applicant or other party filing the form may, instead of making oath or verification where such is prescribed in the forms, set forth a written declaration that all statements made of his own knowledge are true and that all statements made on information and belief are believed to be true, but this may be done only if declarant is warned by wording in the same paper that willful false statements and the like are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and may jeopardize the validity of the application or other document or any registration resulting from the application: See form 4.1a.

Sec.

4.1 Trademark application by an individual; Principal Register with oath.
4.1a Trademark application by an individual; Principal Register with declaration.
4.2 Power of attorney at law (which may accompany application).
4.4 Designation of domestic representative to accompany application.
4.5 Trademark application by a firm; Principal Register.
4.6 Trademark application by a corporation; Principal Register.
4.7 Service mark application; Principal Register.
4.8 Collective mark application (including collective membership mark); Principal Register.
4.9 Certification mark application; Principal Register.
4.10 Application based on concurrent use; Principal Register.
4.11 Application to register on Supplemental Register.
4.13 Application for renewal.
4.14 Affidavit for publication under section 12(c).
4.15 Affidavit required by section 8.
4.16 Affidavit under section 15 (or combined sections 8 and 15).
4.17 Opposition in the United States Patent and Trademark Office.
4.18 Petition to cancel a registration in the United States Patent and Trademark Office.
4.19 Ex parte appeal from Examiner of Trademarks in the United States Patent and Trademark Office.
4.21 Assignment of application.
4.22 Assignment of registration.

AUTHORITY: The provisions of this Part 4 issued under secs. 1, 2, 7, 9, 12, 13, 14, 21, 23, 30, 44, 45, 60 Stat. 427, as amended, sec. 41 60 Stat. 440, sec. 6, 66 Stat. 793; 15 U.S.C. 1051, 1052, 1057, 1059, 1062, 1063, 1064, 1071, 1091, 1112, 1123, 1126, 1127; 35 U.S.C. 6, unless otherwise noted.

§ 4.1 *Trademark application by an individual; Principal Register with oath.*

Mark _____
(Identify the mark)

Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Name of applicant, and trade style, if any)

_____
(Business address, including street, city and State)

_____
(Residence address, including street, city and State)

_____
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for

_____
(Common, usual or ordinary name of goods)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The trademark was first use on the goods (2) on _____ (Date); was first used in (3) _____ (Type of commerce) commerce on _____ (Date); and is now in use in such commerce. (4) The mark is used by applying it to (5) _____ and five specimens showing the mark as actually used are presented herewith.

(6)

State of _____ }
County of _____ } ss.

_____ (Name of applicant), being sworn, states that: he believes himself to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

_____
(Signature of applicant)

Subscribed and sworn to before me, this _____ day of _____, 19____

_____ (*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) below.)

NOTES

(1) If registration is sought for a word or numeral mark not depicted in any special form, the drawing may be the mark typed in capital letters on letter-size bond paper; otherwise, the drawing shall comply with section 2.52.

(2) If more than one item in a class is set forth and the dates given for that class apply to only one of the items listed, insert the name of the item to which the dates apply.

(8) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign applicants relying upon use must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) If the mark is other than a coined, arbitrary or fanciful mark, and the mark is believed to have acquired a secondary meaning, insert whichever of the following paragraphs is applicable:

(a) The mark has become distinctive of applicant's goods as a result of substantially exclusive and continuous use in _____ commerce for the five years next
(Type of commerce)
preceding the date of filing of this application.

(b) The mark has become distinctive of applicant's goods as evidenced by the showing submitted separately.

(5) Insert the manner or method of using the mark with the goods, i.e., "the goods," "the containers for the goods," "displays associated with the goods," "tags or labels affixed to the goods," or other method which may be in use.

(6) The required fee of $35.00 for each class must be submitted.

(7) If the applicant is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

§ 4.1a *Trademark application by an individual; Principal Register with declaration.*

Mark _____
(Identify the mark)
Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Name of applicant, and trade style, if any)
_____
(Business address, including street, city and State)
_____
(Residence address, including street, city and state)
_____
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for
_____
(Common, usual or ordinary name of goods)
and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The trademark was first used on the goods (2) on _____;
(Date)
was first used in (3) _____ commerce
(Type of commerce)
on _____; and is now in use in such commerce.
(Date)

(4) The mark is used by applying it to (5) _____ and five specimens showing the mark as actually used are presented herewith. (6) The undersigned applicant _____
_____
(Name of applicant)
declares: That he believes himself to be the owner of the trademark sought to be registered; that to the best of his knowledge and belief no other person, firm, corporation, or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as may be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

_____
(Signature of applicant)
_____
(Date)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES: See same numbered Notes under form 4.1.

§ 4.2 *Power of attorney at law (which may accompany application).*

Applicant hereby appoints (8) _____,
_____, an attorney at
(Address)
law or attorneys as law, to prosecute this application to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE: (8) An individual attorney at law or individual attorneys at law must be named here. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

§ 4.4 *Designation of domestic representative to accompany application. (9)*

_____
(Name of representative)
where postal address is _____,
(Street, city and State)
is hereby designated applicant's representative upon whom notices or process in proceedings affecting the mark may be served.

NOTE: (9) The designation of a domestic representative must be separate from a power of attorney at law or other authorization of representation.

§ 4.5 *Trademark application by a firm; Principal Register.*

Mark _____
(Identify the mark)
Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Firm name and names of members comprising firm)
_____
(Business address, including street, city and State)
_____
(Domicile of firm)
_____
(Citizenship of members of firm)

(Body of application is same as in form 4.1).

State of _____ } ss.
County of _____ }
_____, being sworn,
(Name of member of firm)
states that he is a member of the applicant firm; he believes said firm to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

_____
(Signature of member of firm)

Subscribed and sworn to before me, this _____ day of _____, 19_____.

_____(*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

§ 4.6 *Trademark application by a corporation; Principal Register.*

Mark _____
(Identify the mark)
Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Corporate name and State or country of incorporation) (10)
_____
(Business address, including street, city and State)

(Body of application is same as in form 4.1.)

State of _____ } ss.
County of _____ }
_____, being sworn.
(Name of corporate officer)
states that: he is _____ of applicant
(Official title)

corporation (10) and is authorized to execute this affidavit on behalf of said corporation; he believes said corporation to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

(Corporate name)

By ---
(Signature of corporate officer and official title.)

Subscribed to and sworn to before me, this ---- day of ----, 19----.

---(*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTE: (10) If applicant is an association or other collective group, the word "association" or other appropriate dsignation should be substituted for "corporation" when referring to applicant.

§ 4.7 *Service mark application; Principal Register.*

Mark ---
(Identify the mark)

Class No. ---
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

The above identified applicant has adopted and is using the service mark shown in the accompanying drawing (11) for ---
(Common, usual or ordinary name of service)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The service mark was first used in connection with the services (2) on ---; was first used in
(Date)

connection with the services rendered in (3) ---
(Type of commerce)

commerce on ---; and is now in use in
(Date)

such commerce. (4)

The mark is used by ---

(State method of using the mark in connection with the services)

and five (12) --- showing the mark as actually used are presented herewith.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6, changing the word "trademark" to "service mark" and the word "goods" to "services.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(11) See Note (1) under form 4.1, and if drawing is not practicable, insert description of the mark instead of reference to the drawing.

(12) Insert "specimens," or state the nature of the representation of the mark which is furnished.

§ 4.8 *Collective mark application (including collective membership mark); Principal Register.*

Mark ---
(Identify the mark)

Class No. ---
(If known)

To the Commissioner of Patents and Trademarks:

(Insert identification of applicant in accordance with form 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the collective mark shown in the accompanying drawing (1) for (13) ---
(Common, usual or ordinary name of goods or services)

to indicate (14) --- and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The collective mark was first used on the (2) ---
(Insert "goods" or "services") (15)

by members of applicant on ---; was first
(Date)

used by said members in (3) ---
(Type of commerce)

commerce on ---; and is now in use in such
(Date)

commerce. (4)

The mark is used by applying it to (5) --- and five specimens of the mark as actually used are presented herewith.

(Insert verification from form 4.6, changing "corporation" to "association" or the like, if necessary.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(13) If the application is for a membership mark, omit the word "for" and the space for the name of the goods or services.

(14) If the application is for a membership mark, insert "membership in applicant organization," or similar appropriate statement. If not for a membership mark, omit the words "to indicate" and the following space.

(15) If the application is for a membership mark, the phrase "on the goods or services" should be omitted.

§ 4.9 *Certification mark application; Principal Register.*

Mark ---
(Identify the mark)

Class No. ---
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5, or 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the certification mark shown in the accompanying drawing (1) for ---
(Insert illustrative examples of the goods or services)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The certification mark, as used by persons authorized by applicant, certifies (16) ---; said mark was first used under the authority of applicant on ---;
(Date)

was first used in (3) ---
(Type of commerce)

commerce on ---; and is now in use in such
(Date)

commerce. (4)

The mark is used by applying it to (5) ---, and five specimens showing the mark as actually used are presented herewith.

Applicant is not engaged in the production or marketing of any goods or services to which the mark is applied.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6, and add after the word "association" the words "other than those authorized by applicant.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(16) Insert an appropriate statement as to what the mark certifies, relating to regional origin; or material, mode of

manufacture, quality, accuracy or other characteristic of the goods; or that the work or labor on the goods or in the performance of the services was performed by members of applicant.

§ 4.10 *Application based on concurrent use; Principal Register.*

Mark ----------
(Identify the mark)
Class No. ----------
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

Use form 4.1, and add at the end of the first paragraph: "for the area comprising ----------";
(List the states for which registration is sought)
and add as final paragraph of application:

The following exception(s) to applicant's right to exclusive use are:

By ----------, doing business at ----------, who is using the mark ----------
(Identify mark and Reg. No. or Ser. No., if any)
for ----------
(Common, usual, or ordinary name of goods or services)
in the States of ----------
by applying the mark to (5) ----------
from ----------
(Earliest known date of such use)
to the present."

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6 and add after the word "association" the words "other than specified in the application.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES: See same numbered Notes under form 4.1.

§ 4.11 *Application to register on Supplemental Register.*

Mark ----------
(Identify the mark)
Class No. ----------
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

For the body of an application for a trademark registration (17), use form 4.1, 4.5 or 4.6, whichever is appropriate, changing the word "Principal" to "Supplemental," and adding a final paragraph to the application as follows:

"The mark sought to be registered has been in lawful use in ----------
(Type of commerce)
commerce in connection with the goods for the year preceding the date of filing of this application." (18)

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

(17) For the body of service mark, collective mark or certification mark applications on the Supplemental Register, use form 4.7, 4.8 or 4.9, whichever is applicable, with the change and addition indicated in this form.

(18) If the mark has not been in use for the year next preceding the filing date, and registration in the United States is required as a basis for obtaining foreign protection of the mark, substitute the following statement for the last sentence: The mark sought to be registered is not in use in ----------
(Type of commerce)
commerce and domestic registration is required as a basis for foreign protection of the mark.

In this instance applicant will be required to make a showing that U.S. registration is required as a basis of foreign protection of the mark.

§ 4.13 *Application for renewal.*

Mark ----------
(Identify the mark)
Reg. No. ----------
Class No. ----------

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant for renewal in accordance with form 4.1, 4.5 or 4.6.) (1)

The above identified applicant for renewal requests that the above identified registration, granted to ----------
(Name of original registrant) on ----------
(Date of Issuance)
which applicant for renewal now owns, as shown by records in the Patent and Trademark Office, be renewed in accordance with the provisions of section 9 of the act of July 5, 1946.

The mark shown in said registration is still in use in (2) ----------
(Type of commerce)
commerce on each of the following goods (3) recited in the registration: ----------; the attached specimen (or facsimile) showing the mark as currently used. (4)

(5)

State of ----------
County of ----------
} ss.

(Name of renewal applicant or of person authorized to sign for renewal applicant)
being sworn, states that the applicant for renewal owns the above identified registration; and that to the best of his knowledge and belief the facts set forth in this application are true.

(Signature of renewal applicant; if renewal applicant is a corporation or other juristic organization, give the official title of the person who signs for renewal applicant.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) Applicant for renewal must be the present owner of the registration.

(2) Type of commerce should be specified as "interstate," "foreign," "territorial," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) If a service mark registration, state "in connection with each of the following services * * *."

(4) If the mark is not in use in commerce at the time of filing the application for renewal, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances. A specimen (or facsimile) illustrating use, or facts as to nonuse, must be submitted for each class sought to be renewed.

(5) The required fee for renewal sought prior to expiration is $25.00 for each class; and for delayed renewal filed within three months after expiration, an additional $5.00 for each class. If renewal is sought for less than the total number of classes in the registration, the classes for which renewal is sought should be specified.

(6) If applicant for renewal is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.14 *Affidavit for publication under section 12(c).*

Mark ----------
(Identify the mark)
Reg. No. ----------
Date of issue ----------
To: ----------
(Name of original registrant)

State of ----------
County of ----------
} ss.

(Name of registrant or of person authorized to sign for a juristic registrant)
being sworn, states that (1) ----------
(Name of registrant)
owns the above identified registration, as shown by records in the Patent and Trademark Office; that said registration is now in force; that the mark shown therein is in use in (2) ----------
(Type of commerce)

commerce on each of the following goods (3) recited in the registration _____; and that the benefits of the act of July 5, 1946, are hereby claimed for said registration.

(4)

_____
(Signature: if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (5) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) If a service mark registration, state: "in connection with each of the following services."

(4) The required fee of $10.00 must be submitted.

(5) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.15 *Affidavit required by section 8.*

Mark _____
(Identify the mark)
Reg. No. _____
Class No. _____

State of _____ } ss.
County of _____ }

_____
(Name of registrant or of person authorized to sign for a juristic registrant)

being sworn, states that (1) _____
(Name of registrant)

owns the above identified registration issued _____
(Date)

(2), as shown by records in the Patent and Trademark Office; and that the mark shown therein is still in use (3) as evidenced by (4) _____.

(5)

_____
(Signature: if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on _____."
(Date)

(3) If the mark is not in use at the time of filing the affidavit, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances.

(4) Insert "the specimen included showing the mark as currently used," or recite facts as to sales or advertising which will show that the mark is in current use. Specimen illustrating use, or facts as to use or nonuse, are required for each class for which action is sought.

(5) The required fee of $10.00 must be submitted for each class for which action is sought, and if action is sought for less than the total number of classes in the registration, the classes for which action is sought should be specified.

(6) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.16 *Affidavit under section 15 (or combined sections 8 and 15).*

Mark _____
(Identify the mark)
Reg. No. _____
Class No. _____

State of _____ } ss.
County of _____ }

_____
(Name of registrant or of person authorized to sign for a juristic registrant)

being sworn, states that (1) _____
(Name of registrant)

owns the above identified registration issued _____
(Date)

(2), as shown by records in the Patent and Trademark Office; that the mark shown therein has been in continuous use in (3)

_____
(Type of commerce)

commerce for five consecutive years from (4) _____ to the present, on each of the following goods (5) recited in the registration: _____; that such
(Date)
(List of Goods)

mark is still in use in (3) _____
(Type of commerce)

commerce; that there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register, and that there is no proceeding involving said rights pending and not disposed of either in the Patent and Trademark Office or in the courts.

_____
(Signature: if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See rule 4.2 and Note (6) below.)

NOTES

This form may be used as a combined affidavit under sections 8 and 15 provided it contains matter which will meet the requirements of section 8 as to use or nonuse and fee (see form 4.15, Notes (3), (4) and (5)).

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on _____."
(Date)

(3) Type of commerce must be specified as "interstate," "territorial," "foreign," or such other commerce as may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) The date should be the beginning of a five year period of continuous use, all of which five year period falls after the date of registration under the act of 1946 or after the date of publication under section 12(c). A date which would produce a period of continuous use which is longer than five years may be stated provided the period indicated includes five years of continuous use after registration under the act of 1946 or publication under section 12(c).

(5) If a service mark registration, state: "in connection with each of the following services."

(6) If registrant is not domiciled in the United States, a domestic representative must be designated as to the section 8 affidavit. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.17 *Opposition in the United States Patent and Trademark Office.*

In the matter of application Serial No. _____.
Published in the OFFICIAL GAZETTE on _____.
(Date)

_____
(Name of opposer)
v.
_____
(Name of applicant)

Opposition No. _____
(To be inserted by Patent and Trademark Office)

_____, a(n) (1) _____,
(Name of opposer) (Legal entity of opposer)
located and doing business at _____,
(Street, city and State)

believes that he will be damaged by registration of the mark shown in the above identified application, and hereby opposes the same.

As grounds of opposition, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why opposer believes he will be damaged.)

(2)

_____
(Signature of opposer; if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

State of _____ }
County of _____ } ss.

_____
(Name of opposer or of person authorized to sign for opposer)

being sworn, states that he is the opposer named in the foregoing opposition, or is the person authorized to sign for the opposer named in the foregoing opposition; that he has read and signed the opposition and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he believes them to be true.

_____
(Signature of opposer; if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

(JURAT) (use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1. For opposers who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as _____," if there is a trade style. If a partnership, state: "a partnership composed of _____ (Names of members)" If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of _____ (State or country)"

(2) The required fee of $25.00 must be submitted for each class to be opposed, and if opposition is sought for less than the total number of classes, the classes sought to be opposed should be specified.

§ 4.18 *Petition to cancel a registration in the United States Patent and Trademark Office.*

In the matter of Registration No. _____
Date of Issue _____

_____
(Name of petitioner)
v.
_____
(Name of registrant)

Cancellation No. _____
(To be inserted by Patent and Trademark Office)

_____, a(n) (1) _____,
(Name of petitioner) (Legal entity of petitioner)
located and doing business at _____,
(Street, city and State)
that he is or will be damaged by the above identified registration, and hereby petitions to cancel the same.

As grounds therefor, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why petitioner believes that he is or will be damaged.)

(2)

_____
(Signature of petitioner; if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

State of _____ }
County of _____ } ss.

_____
(Name of petitioner or of person authorized to sign for petitioner)

being sworn, states that he is the petitioner named in the foregoing petition to cancel, or is the person authorized to sign for the petitioner named in the foregoing petition to cancel; that he has read and signed the petition to cancel and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he believes them to be true.

_____
(Signature of petitioner to cancel; if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

See form 4.2 and Note (7) under form 4.1. For petitioners who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as _____," if there is a trade style. If a partnership, state: "a partnership composed of _____ (Names of members)" If a corporation, association, or other organization, state "a corporation (or specify other type of organisation) organized and existing under the laws of _____ (State or country)"

(2) The required fee of $25.00 must be submitted for each class sought to be cancelled. and if cancellation is sought for less than the total number of classes, the classes sought to be cancelled should be specified.

§ 4.19 *Ex parte appeal from Examiner of Trademarks in the United States Patent and Trademark Office.*

_____
(Name of applicant)

_____
(Serial number of application)

To the Trademark Trial and Appeal Board:

Applicant hereby appeals to the Trademark Trial and Appeal Board from the decision of the Examiner of Trademarks refusing registration.

_____
(Signature of applicant; if applicant is a corporation or other juristic organization, give the official title of the person who signs for applicant.)

§ 4.21 *Assignment of application.*

Whereas _____, of
(Name of assignor)
_____
(Street, city, and State)
has adopted and is using a mark for which he has filed application in the United States Patent and Trademark Office for registration, Serial No. _____; and

Whereas _____, of
(Name of assignee)
(1) _____,
(Street, city, and State)
is desirous of acquiring said mark;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said _____
(Name of assignor)
does hereby assign unto the said _____
(Name of assignee)
all rights, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified application for registration of said mark.

The Commissioner of Patents and Trademarks is requested to issue the certificate of registration to said assignee.

_____
(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of _____ }
County of _____ } ss.

On this _____ day of _____, 19____, before me appeared _____, the person who

signed this instrument on his own behalf, or who was authorized to sign on behalf of the identified corporation or other juristic entity, who being sworn, acknowledged that he signed this instrument as a free act.

----------(*)
(Notary Public)

(*) (The acknowledgement shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

NOTES

(1) If the postal address of the assignee is not given either in the instrument or in an accompanying paper, registration to the assignee may be delayed.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See Form 4.4.

§ 4.22 *Assignment of registration.*

Whereas ----------, of
(Name of assignor)

(Street, city, and State)
has adopted, used and is using a mark which is registered in the United States Patent and Trademark Office, Registration No. ----------, dated ----------; and

Whereas ----------, of
(Name of assignee)
(1) ----------,
(Street, city, and State)
is desirous of acquiring said mark and the registration thereof;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said ----------
(Name of assignor)
does hereby assign unto the said ----------
(Name of assignee)
all rights, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified registration thereof.

(2)

(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of ----------}
County of ----------} ss.

On this ------ day of ----------, 19----, before me appeared ----------, the person who signed this instrument on his own behalf, or who was authorized to sign this instrument on behalf of the identified corporation or other juristic entity, who being sworn, acknowledged that he signed this instrument as a free act.

----------(*)
(Notary Public)

(*) (The acknowledgement shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction or execution, must be affixed.)

NOTES

(1) If the postal address of the asignee is not given either in the instrument or in an accompanying paper, recording may be delayed pending receipt of such address.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

Effective date: These revisions become effective on May 1, 1976.

Dated: April 6, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: April 22, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 41 F.R. 17726, Apr. 28, 1976

[946 O.G. TM 222 (May 25, 1976)]

(349) TRADEMARK MANUAL OF EXAMINING PROCEDURE (REVISED PAGES)

The first set of revised pages for insertion in the Trademark Manual of Examining Procedure (TMEP) is now being distributed to subscribers of the Manual by the Superintendent of Documents, United States Government Printing Office. These pages are identified as "Rev. 1, Jan. 1976."

This announcement is being made as a service to subscribers so that they will be aware that a revision of the Manual has been published. Inquiries concerning subscriptions, or the delivery of revision material, should be sent to the Superintendent of Documents, United States Government Printing Office, Customer Service Section SSOS, Washington, D.C. 20402.

The availability of the Trademark Manual of Examining Procedure, with instructions for ordering, was announced in the OFFICIAL GAZETTE of June 25, 1974 (923 O.G. TM 204). It continues to be available as described in that notice.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

Apr. 26, 1976.

[947 O.G. TM 2 (June 1, 1976)]

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(350) PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Open Meeting

In accordance with section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92–463), announcement is made of the following committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:30 a.m. to 5 p.m. on June 15, 1976 at the United States Trademark Association, 6 East 45th Street, New York, N.Y. 10017.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuous source of knowledge from the private sector to the government in the field.

The agenda for the meeting is:

(1) Establishment of an agenda and plans for a meeting of the committee in the Fall of 1976.

(2) Discussion of expanding the committee membership.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda items will be allowed. Any comments or suggestions relating to the agenda items should be submitted in writing before June 7. Further, comments and suggestions will be accepted after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request 60 days after the meeting.

Inquiries may be addressed to Patricia M. Davis, Room 11C17, Crystal Plaza Building 3, Telephone: 703–557–3881.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: May 12, 1976.

DAVID B. CHANG,
Acting Assistant Secretary for Science & Technology.

Published in 41 F.R. 20728, Apr. 28, 1976

[947 O.G. TM 114 (June 15, 1976)]

(351)

SPECIAL BICENTENNIAL GRANT COVERS

The Patent and Trademark Office will use special grant covers with a bicentennial motif on patents issued and trademarks registered, beginning July 6, 1976 and continuing through the last six months of 1976.

The patent covers will be printed in blue on white paper, with a bicentennial motif, bound with red ribbon and sealed with a gold seal.

The trademark certificate of registration on the Principal Register covers will be printed in blue on white paper with a gold bicentennial motif and sealed with a gold seal. The trademark Certificate of Renewal will be printed in blue on buff paper with a red bicentennial motif and sealed with a red seal. The trademark certificate of registration on the Supplemental Register will be printed in blue on white paper with a blue bicentennial motif and sealed with a blue seal.

Reduced size samples of these special covers are illustrated below.

May 25, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

1776 - 1976

THE UNITED STATES OF AMERICA

CERTIFICATE OF REGISTRATION

This is to certify that the records of the Patent and Trademark Office show that an application was filed in said Office for registration of the Mark shown herein, a copy of said Mark and pertinent data from the Application being annexed hereto and made a part hereof.

And there having been due compliance with the requirements of the law and with the regulations prescribed by the Commissioner of Patents and Trademarks.

Upon examination, it appeared that the applicant was entitled to have said Mark registered under the Trademark Act of 1946, and the said Mark has been duly registered this day in the Patent and Trademark Office on the

SUPPLEMENTAL REGISTER

to the registrant named herein.

This registration shall remain in force for Twenty Years, unless sooner terminated as provided by law.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent and Trademark Office to be affixed this

C. Marshall Dann

COMMISSIONER OF PATENTS AND TRADEMARKS

AMERICAN REVOLUTION BICENTENNIAL
1776 - 1976
No.
THE UNITED STATES OF AMERICA
TO ALL TO WHOM THESE PRESENTS SHALL COME:
WHEREAS THERE HAS BEEN PRESENTED TO THE
COMMISSIONER OF PATENTS AND TRADEMARKS
A PETITION PRAYING FOR THE GRANT OF LETTERS PATENT FOR AN ALLEGED NEW AND USEFUL INVENTION THE TITLE AND DESCRIPTION OF WHICH ARE CONTAINED IN THE SPECIFICATIONS OF WHICH A COPY IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PATENT AND TRADEMARK OFFICE IN THE CLAIMANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID CLAIMANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A PATENT UNDER THE LAW.
NOW, THEREFORE, THESE LETTERS PATENT ARE TO GRANT UNTO THE SAID CLAIMANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID CLAIMANT(S) FOR THE TERM OF SEVENTEEN YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF ISSUE FEES AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM MAKING, USING OR SELLING THE SAID INVENTION THROUGHOUT THE UNITED STATES.
IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the PATENT AND TRADEMARK OFFICE to be affixed at the City of Washington this day of in the year of our Lord one thousand nine hundred and seventy-six, and of the Independence of the United States of America the two hundredth and first.
Attest:
Acting Officer
C. Marshall Dann
Commissioner of Patents and Trademarks

(352) CERTIFICATE OF MAILING OF CORRESPONDENCE

[37 CFR Parts 1, 3 and 4]

Delays in Mail Delivery

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Public Law 92-132, 85 Stat. 364), and in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93-596, 88 Stat. 1949) the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by adding §§ 1.8, 3.55 and 4.23.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. A procedure similar to this proposal, dated December 23, 1975 was published in the OFFICIAL GAZETTE on January 20, 1976 at 942 O.G. 1073 for comment. Comments received in response to this proposal have been considered in the preparation of this proposed rule change and will be given further consideration before the promulgation of any rule. A number of changes have been made in the earlier proposal as a result of these comments.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes in writing to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before August 20, 1976. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. No oral hearing will be held.

Comments previously submitted relating to the notice of December 23, 1975 need not be resubmitted since they will again be evaluated along with any comments received directed to these proposed rules.

This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A-107 and determined to have no major inflationary impact.

The promulgation of the proposed rule change is within the authority granted the Commissioner under 35 U.S.C. 6 since it is "not inconsistent with law" and since it is "for the conduct of proceedings in the Patent and Trademark Office."

Under the proposed rules, generally, where a time is set for taking action in any pending patent or trademark application or in most patent or trademark proceedings pending before the Patent and Trademark Office, correspondence or fees will be considered as being timely filed if (1) deposited with the United States Postal Service within the time set for response, and (2) accompanied by a certificate indicating when the correspondence or fee was so deposited. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated.

The proposed procedure would relate to all actions taken before the Patent and Trademark Office except:

(1) The filing of patent and trademark applications;

(2) The filing of agreements between parties to an interference under 35 U.S.C. 135(c); and

(3) The following requirements of the Trademark Act applying to the registration of a mark;

(i) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c);

(ii) The filing of an application for renewal of a registration under Section 9;

(iii) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b); and

(iv) The filing of an affidavit under Section 15, subsection (3).

The date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The proposed addition of a new section 1.8(a) would establish the Certificate of Mailing procedure. Proposed new § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Proposed form § 3.55 is designed for use in patent cases and proposed form § 4.23 is designed for use in trademark cases when making a certificate under § 1.8(a).

It is therefore proposed to amend 37 CFR, Chapter 1, as follows:

PART 1.—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 which reads as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms §§ 3.55 and 4.23). The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of original or reissue patent applications;

(ii) The filing of trademark application;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act;

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act; and

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act.

(b) In the event that correspondence or fees are timely mailed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under 37 CFR 1.68 or 2.20 which attests to the previous timely mailing.

PART 3—FORMS IN PATENT CASES

2. By adding a new § 3.55 which reads as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on

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Date

Name of applicant, assignee, or Registered Representative

Signature

Date

PART 4—FORMS IN TRADEMARK CASES

3. By adding a new § 4.23 which reads as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on

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Date

Name of applicant, assignee, or applicant's attorney

Signature

Date

Dated: June 3, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: June 10, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[948 O.G. TM 154 (July 20, 1976)]

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(353) INTERNATIONAL PROTECTION OF GOVERNMENT EMBLEMS AND SEALS

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one departmental seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of December 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by September 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1½ inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Dated: August 18, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Published in 41 F.R. 35741

[950 O.G. TM 114 (Sept. 21, 1976)]

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(354) AVAILABILITY OF 1976 EDITIONS OF PATENT LAWS AND TITLE 37 CODE OF FEDERAL REGULATIONS

The July, 1976, edition of Title 37, Code of Federal Regulations, entitled "Patents, Trademarks, and Copyrights," is now for sale by the Superintendent of Documents for $2.20 per copy. The format of this booklet has been restructured to allow parts pertaining to patent regulations and trademark regulations to be grouped separately. This booklet is published by the Office of the Federal Register and contains all patent rules and forms, trademark rules and forms as well as the copyright rules. The stock number is 022-003-93248-0.

A revised edition of the "Patent Laws" booklet dated August, 1976, is also available from the Superintendent of Documents at a cost of $2.10 per copy. The stock number for the "Patent Laws" is 003-004-00535-1.

Orders for both booklets should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

RENE D. TEGTMEYER,
Sept. 24, 1976. *Assistant Commissioner for Patents.*

[951 O.G. TM 140 (Oct. 19, 1976)]

(355) PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Open Meeting

In accordance with section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92-463), announcement is made of the following committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:00 a.m. to 5:00 p.m. on October 20-21, 1976 at the National Lawyers Club, 1815 H Street, NW., Washington, D.C.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuous source of knowledge from the private sector to the government in the field. The agenda for the meeting is:

(1) Opening remarks.

(2) Report and discussion of a study conducted on the Post Registration Section including:

a. Suspension of an application for one year due to non-use.
b. Mailing of two cancellation notices.
c. Cancellation of one class in a multiple class application by failure to file a Section 8 for that class.
d. Authority of the Director to revoke Section 8 acceptances.
e. Forms, procedures and policies in Post Registration Section.

(3) Report and discussion of the Patent and Trademark Office plans for applying ADP techniques in the Trademark Operation.

(4) Report and discussion of the Patent and Trademark Office policy on length of time for retention of files in the Office.

(5) Report and discussion of various aspects of discovery practice including:

a. Pretrial conferences.
b. Protective orders.
c. Amendment to Rule 2.122(b).
d. How to introduce discovery depositions including who submits the deposition, how many copies of the deposition, and who is the party offering the deposition under Rule 120(a)(3).

(6) Report and discussion of the international classification system.

(7) Report and discussion on the possibility of establishing guidelines as to matters which are the proper subject for a petition to the Commissioner and those which are properly appealable to the Trademark Trial and Appeal Board.

(8) Report and discussion on the possibility of naming of firms as attorneys of record.

(9) Report and discussion on current practice regarding restoration of jurisdiction over trademark applications.

(10) Report and discussion of the Patent and Trademark Office mail room study.

(11) Report and discussion on implementation of the Committee's previous recommendations.

(12) Closing remarks.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda items will be allowed. Any comments or suggestions relating to the agenda items should be submitted in writing before October 13, 1976. Further, comments and suggestions will be accepted after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request 60 days after the meeting.

Inquiries may be addressed to Patricia M. Davis, Room 11C17 Crystal Plaza Building 3, Telephone: 703-557-3881.

LUTRELLE F. PARKER,
Sept. 23, 1976. *Deputy Commissioner of Patents and Trademarks.*

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[951 O.G. TM 143 (Oct. 19, 1976)]

(356) INDICATION OF CHANGES IN RULES

The Office of the Federal Register now accepts for publication rule change proposals in which additions are enclosed between arrows (►◄) and deletions are enclosed in brackets ([ ]). This format will be used by the Patent and Trademark Office whenever appropriate since it permits an easy determination of what changes are proposed without the need for making a side-by-side comparison with the current rule language.

Although the Federal Register permits the use of arrows and brackets only in rule change proposals because a clean copy of the promulgation is desired for use in printing the Code of Federal Regulations, the Publication in the OFFICIAL GAZETTE of both the proposal and the promulgation of rule changes will contain the arrows and brackets whenever changes are made in current rules. If a rule change substantially rewrites, adds, or deletes entire rules, arrows and brackets will not be used.

Arrows are used rather than underlining to show additional subject matter since underlining and italics are to be used in rules for items such as scientific terms and paragraph headings.

Dated: Oct. 5, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[951 O.G. TM 210 (Oct. 26, 1976)]

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(357) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

Certificate of Mailing of Correspondence

On June 21, 1976, notice was published in the Federal Register (41 FR 24895) of a proposal to amend Title 37, Code of Federal Regulations by adding new §§ 1.8, 3.55 and 4.23. Interested persons were invited to comment on the proposal on or before August 20, 1976. Twenty-two comments were submitted. Nineteen were favorable to the proposal and two were neutral. One adverse comment was received. Consideration was given to these comments, as well as to 147 comments received in response to an earlier notice published in the OFFICIAL GAZETTE of the Patent and Trademark Office on January 20, 1976 (942 O.G. 1073). Of these 147 comments, 131 were in favor of a certificate of mailing procedure, 11 were opposed and 5 were neutral. Both sets of comments, and a summary and analysis of each set, are available for public inspection in Room 11E10 of Crystal Plaza Building 3 at 2021 Jefferson Davis Highway in Arlington, Virginia.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. Except in those cases spelled out in new § 1.8, papers and fees will be considered as being timely filed if they are deposited with the U.S. Postal Service on or before the expiration of the period set for response. However, the date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The exceptions spelled out in new § 1.8 are intended to exclude from the new procedure those cases where filing in the Office, or with the Commissioner, is a requirement of statute. In view of five comments questioning the authority of the Commissioner to adopt the new procedure, two further exceptions have been included in § 1.8. In all other cases, the new procedure would not be inconsistent with statute, and therefore would be within the authority of the Commissioner to adopt. The suggestion, advanced in eight comments, that there should be no exceptions, was not adopted.

One comment suggested that attestation be made on a personal knowledge basis and this suggestion has been adopted. In response to another comment, the text of § 1.8 has been amended to indicate more clearly who may sign the certificate. Finally, several comments expressed concern about the possibility of fraud. However, the use of a post card receipt (see Notice dated November 21, 1968) would seem to minimize this possibility.

The addition of a new § 1.8(a) establishes a Certificate of Mailing procedure. New § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Form § 3.55 is designed for use in patent cases and form § 4.23 is designed for use in trademark cases when making a certificate under § 1.8(a).

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Parts 1, 3 and 4 of Title 37, Code of Federal Regulations, are hereby amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of patent applications;

(ii) The filing of trademark applications;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act, 15 U.S.C. 1059;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act, 15 U.S.C. 1064(a), 1064(b);

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065;

(viii) The filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or Section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Customs and Patent Appeals;

(ix) The filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under Section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2); and

(x) The filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

(b) In the event that correspondence or fees are timely filed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under § 1.68 or § 2.20 which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing.

PART 3—FORMS FOR PATENT CASES

2. By adding a new § 3.55 as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ----------

Date

Name of applicant, assignee, or Registered Representative

Signature

Date

PART 4—FORMS FOR TRADEMARK CASES

3. By adding a new § 4.23 as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____

Date

Name of applicant, assignee, or applicant's attorney

Signature

Date

Effective date: These amendments shall become effective on November 1, 1976.

Dated: September 28, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: September 17, 1976.
BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76-28915; Filed 10-1-76; 8:45 am]

[951 O.G. TM 210 (Oct. 26, 1976)]

(358) CERTIFICATE OF MAILING PROCEDURES

The Patent and Trademark Office has promulgated new Rules 1.8 and forms 3.55 and 4.23 which establish a new Certificate of Mailing Procedure, effective November 1, 1976.

In order to assist the Patent and Trademark Office in the effective handling of these certificates, the following guidelines are suggested.

Location of Certificate

The preferred location for the Certificate of Mailing is at the end of any correspondence mailed to the Office. In those situations where the certificate accompanies a fee or other form such as the issue fee transmittal form PTO–85, which does not have space for a certificate, the certificate should appear on a separate cover letter which refers to the accompanying paper. When a separate cover letter is used, a clear identification of the type of correspondence should be included.

Although not specifically required by the rule, it is preferred that the certificate be signed by the applicant, assignee, or attorney. The certificate should be signed separately from the correspondence itself. Suggested wording of the certificate is set forth in form 3.55 for patent cases and form 4.23 for trademark cases.

A separate certificate should be made for papers filed in each individual application, if papers for several different applications are mailed in a single envelope.

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period.

WILLIAM FELDMAN,
Oct. 26, 1976. *Deputy Assistant Commissioner for Patents.*

[952 O.G. TM 174 (Nov. 16, 1976)]

PATENT NOTICES WHICH ALSO PERTAIN TO TRADEMARKS

REVISION OF "DISCONTINUANCE OF DEPOSIT ACCOUNT SERVICE FOR SALE OF PATENT COPIES"

In view of the difficulties experienced by many of its customers, the Patent Office is revising the Notice appearing in the December 1, 1964 issue of the *Official Gazette of the U.S. Patent Office*. This Notice—Discontinuance of Deposit Account Service for Sale of Patent Copies—is revised to except certain types of patent copy orders.

The Patent Office will now accept lists of fifty (50) or more numbers arranged in numerical sequence to be charged to Deposit Accounts. Service charges, such as Special Handling and Air Mail postage for these orders, may also be charged to Deposit Accounts.

C. A. KALK,
July 15, 1965. *Director of Administration.*

[818 O.G. 1207]

ACCESSIBILITY OF ASSIGNMENT RECORDS

In view of a number of inquiries as to the manner in which Rule 1.12 of the Patent Office Rules of Practice, as amended August 23, 1965 (819 O.G. 443) is to be applied, the procedure which it is planned to follow in certain types of cases is set forth below.

1. Assignments relating to applications for registration of trademarks will be open to public inspection as heretofore.

2. The Office will not open certain parts only of an assignment document to public inspection. If such a document contains two or more items, any one of which, if alone, would be open to such inspection, then the entire document will be open. Thus, if an assignment covers either a trademark or a patent in addition to one or more patent applications, it will be available to the public ab initio; and if it covers a number of patent applications, it will be so available as soon as any one of them is patented. Assignments relating only to one or more pending applications for patent will not be open to public inspection.

3. If the application on which a patent was granted is a division or continuation of an earlier case, the assignment records of that case will be open to public inspection; similar situations involving continuation in part applications will be considered on their individual merits.

4. Assignment records relating to reissue applications will be open to public inspection.

EDWARD J. BRENNER,
Dec. 15, 1965. *Commissioner.*

[822 O.G. 769]

DEPOSIT ACCOUNTS—STATUTORY FEE CHARGES

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

TELEPHONE NUMBERS ON AMENDMENTS AND OTHER PAPERS

In view of the increased use of telephone interviews regarding matter which can be readily cleared up by a telephone call to applicant or his representative, it is again recommended that amendments and other papers, such as letters of transmittal, include the complete telephone number with area code and extension, preferably near the signature of the writer.

RICHARD A. WAHL,
Mar. 11, 1966. *Assistant Commissioner.*

[825 O.G. 1]

ZIP CODE REMINDER

By Executive Memorandum of June 18, 1965, President Johnson directed all Federal Agencies to take the lead in adopting the ZIP Code system and instructed the Postmaster General to issue regulations governing the use of ZIP Codes by such agencies.

Pursuant to this directive, Section 137.26 has been added to the Postal Manual requiring compliance by Federal Agencies as follows:

1. Effective January 1, 1966, official mailings containing typed or handwritten addresses must include the ZIP Code.
2. Effective January 1, 1967, all Federal Agencies must use the ZIP Code in the addresses on *all* official mail and are required to presort quantity mailings by ZIP code.

TO THIS END, ALL FUTURE LETTERS, COUPONS, AND OTHER PAPERS BEARING THE SENDERS'S ADDRESS WHICH ARE MAILED TO THE PATENT OFFICE MUST SHOW THE ZIP CODE DESIGNATION OF BOTH THE SENDER AND THE PATENT OFFICE.

The Patent Office ZIP Code is 20231. This designation should be used when writing to the Patent Office for any matter. In addition, the sender's own ZIP Code designation should be given. The benefits to be gained by the immediate use of ZIP Code are many: positive identification of areas; faster delivery of mail by reducing the number of handlings from point of origin to destination; and easier identification of post office address.

C. A. KALK,
Mar. 22, 1966. *Director of Administration.*

[825 O.G. 428]

PRACTICE IN THE USE OF ACCOUNTS FOR PAYMENT OF STATUTORY FEES

In the OFFICIAL GAZETTES of March 15, 22, and 29, there appeared copies of an announcement by the Commissioner providing for a trial use of accounts established under Rule 25 for the payment of statutory fees. A number of questions have come up in connection with the use of accounts in the payment of these fees prescribed by Public Law 89–83 and, in the interest of uniform practice, publication of a statement is warranted.

A general direction by an applicant or attorney to charge to an account these fees as they arise in any application prosecuted by the applicant, the attorney, or the firm will not be effective for such a purpose. Authority to make charges will be limited to a particular application.

A separate direction to charge shall be filed for each fee. Each such direction to charge a fee shall be transmitted on a separate sheet of paper and, in the case of fees based on modification of claims shall include the best estimate of the fee due. Failure to include such an estimate provides the basis for a refusal to enter any amendment transmitted therewith, as an incomplete response. Where variable fees are involved inclusion of a direction to charge or credit a deficiency or overpayment would appear appropriate.

An issue fee will be charged to an account until a notice of allowance has been forwarded and a reply to that notice received.

For the purposes of determining the fee due the Patent Office, a claim will be treated as dependent if it contains reference to one other claim in the application. A claim determined to be dependent by this test will be entered if the fee paid reflects this determination. This does not, however, prevent the rejection of such a claim as improper, if, in fact, it is not a dependent claim.

EDWARD J. BRENNER,
Apr. 12, 1966. *Commissioner of Patents.*

[825 O.G. 1183]

DEPOSIT ACCOUNTS

The practice instituted on May 1, 1966, pursuant to the notice of February 23, 1966 (824 O.G. 1200), whereby statutory fees may be charged against deposit accounts, and such accounts are closed if overdrawn, has resulted in certain difficulties for the Patent Office and deposit account holders. It has been decided therefore to modify that practice as indicated below.

As was pointed out in that notice, the charging of a fee against an overdrawn account cannot be considered as payment of the fee until a proper balance is restored or payment is made in some other way. Accordingly, deposit account holders who charge such fees must assume the risk of losing vital dates if they do not maintain a proper balance in their accounts at all times.

Apart from this, however, the overdrawing of an account places a burden on the Patent Office, particularly where a number of items are charged after the overdraft occurs, and it is appropriate that those who are responsible for causing such a condition should bear the cost of correcting it. In view of this fact, and of the hardship frequently caused if an account is permanently closed, the practice of closing deposit accounts merely because they are overdrawn will be discontinued, effective August 1, 1966. In lieu thereof an overdrawn account will be immediately suspended and no charges will be accepted against it until a proper balance is restored, together with a payment of ten dollars to cover the work done by the Patent Office incident to suspending and reinstating the account and dealing with charges which may have been made in the meantime. It is expected, however, that reasonable precautions will be taken in all cases to avoid overdrafts, and if an account is suspended repeatedly it will be necessary to close it.

Similarly, because of the burden placed on the Patent Office incident to the operation of deposit accounts, a charge of ten dollars will be made for opening each new account.

EDWARD J. BRENNER,
June 23, 1966. *Commissioner.*

[828 O.G. 377]

RECORDING OF INSTRUMENTS

Effective April 1, 1967, the Patent Office will accept and record legible certified copies of original assignments or other instruments.

The certified copy, if not in the English language, will not be recorded unless accompanied by a translation signed by the translator.

Certification shall be to the fact that the instrument submitted is a true copy of the original and shall be made by a notary public or, if in a foreign country, by a consular officer of the United States or an officer authorized to administer

oaths and authenticated by a consular officer of the United States.

RICHARD A. WAHL,
Mar. 3, 1967. *Assistant Commissioner.*

[836 O.G. TM 145 (Mar. 28, 1967)]

OFFICIAL PATENT OFFICE MAILING ADDRESS REMAINS WASHINGTON, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

[860 O.G. 662]

CHANGE IN LEGAL HOLIDAYS

Those doing business before the Patent Office are hereby reminded that by Public Law 90-363, 82 Stat. 250, effective January 1, 1971, Section 6103(a) of Title 5, United States Code, was amended to read as follows:

§ 6103. *Holidays*

(a) The following are legal public holidays:
New Year's Day, January 1.
Washington's Birthday, the third Monday in February.
Memorial Day, the last Monday in May.
Independence Day, July 4.
Labor Day, the first Monday in September.
Columbus Day, the second Monday in October.
Veterans Day, the fourth Monday in October.
Thanksgiving Day, the fourth Thursday in November.
Christmas Day, December 25.

Each of the holidays enumerated will constitute "a holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code.

WILLIAM E. SCHUYLER, JR.,
Dec. 2, 1970. *Commissioner of Patents.*

[881 O.G. 1707]

EDITORIAL NOTE: Sec. 6103(c) states that January 20 of each fourth year after 1965, Inauguration Day, is also a legal public holiday.

PATENT OFFICE BUSINESS HOURS

This procedure is being published to bring to the attention of the public security provisions concerning the Patent Office premises and Patent Office files.

The public is reminded that the Patent Office working hours are 8:30 a.m. to 5:00 p.m. Monday through Friday, excluding legal holiday in the District of Columbia. Outside these hours, only Patent Office employees are authorized to be in areas of the Patent Office other than the Public Search Rooms. Of course, a member of the public engaged in a discussion of business with an Office employee may be invited by the employee to stay beyond Office hours to conclude the discussion.

The hours for the Public Search Room are 8:00 a.m. to 8:00 p.m., and the hours for the Trademark Search Room are 8:00 a.m. to 6:00 p.m. Monday through Friday, excluding legal holidays in the District of Columbia.

During working hours, all applicants, attorneys, and other members of the public should announce their presence to the Office personnel in the area of their visit. In the Examining Groups, visitors should inform the group receptionist of their presence before visiting other areas of the Group.

RENE D. TEGTMEYER,
Sept. 27, 1973. *Acting Commissioner of Patents.*

[915 O.G. 1164]

TERMINATION OF THE "RULES OF PRACTICE IN PATENT CASES" BOOKLET

The Superintendent of Documents has informed the Patent Office that the basic rule book entitled "Rules of Practice in Patent Cases" is out of print and no longer available. Furthermore, Revision 3, dated July 1973, is the last revision covered by the current subscriptions. A booklet entitled "37 Code of Federal Regulations," published by the Office of the Federal Register, contains all patent rules and forms, as well as trademark rules and forms and copyright rules. Inasmuch as this publication is revised annually and is more economical to both the public and the Patent Office even if repurchased annually, the Patent Rules of Practice booket will not be reprinted, thereby terminating this duplication of printing. Consequently, it is suggested that persons desiring a copy of the patent rules order a copy of "37 Code of Federal Regulations" from the Superintendent of Documents. The price for the most recent issue, dated July 1, 1973, is $1.75.

The Patent Office will supply all patent examiners and other appropriate employees with a copy of "37 Code of Federal Regulations" annually beginning with the July 1974 edition.

Since the inventory of the Trademark Rules of Practice booklet is in large supply, it will continue to be offered for sale by subscription from the Superintendent of Documents and updatings will continue to be published periodically.

C. MARSHALL DANN,
Mar. 18, 1974. *Commissioner of Patents.*

[921 O.G. 860]

CHANGE IN NAME OF THE PATENT OFFICE

(Public Law 93-596)

On January 2, 1975, President Ford signed into law H.R. 7599, a bill changing the name of the Patent Office to the "Patent and Trademark Office" and the title of the Commissioner of Patents to the "Commissioner of Patents and Trademarks." This change reflects the dual role of the Patent Office in administering both the patent law (Title 35, United States Code) and the Trademark Act of 1946 (60 Stat. 427, 15 U.S.C. 1051, et seq.).

In order to minimize the cost of implementing this law (P.L. 93-596) and because of the similarity of the old and new names, existing stationery, printed forms, publications, etc. will continue in use until such supplies are exhausted. During the interim, the terms "Patent Office" and "Commissioner of Patents," appearing on patent grants and other official documents issued or dated on and after January 2, 1975, shall be construed to mean "Patent and Trademark Office" and "Commissioner of Patents and Trademarks." This same interpretation shall apply to the use of these terms in the patent and trademark rules of practice, 37 CFR, Parts 1 and 2, until such time as the Code of Federal Regulations is revised and new rules of practice are published.

In addition, the public is encouraged to minimize its costs in complying with this new law by exhausting reasonable quantities of existing stationery and forms which contain printed reference to the Patent and Trademark Office as the Patent Office and the Commissioner of Patents and Trademarks as the Commissioner of Patents. In preparing other written matter for submission to the Patent and Trademark Office, the public should use the new designations.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: Jan. 27, 1975.

BETSY ANCKER-JOHNSON, PH.D.,
Assistant Secretary for Science and Technology.

Public Law 93-596
93rd Congress, H. R. 7599
January 2, 1975

An Act

88 STAT. 1949

To amend the Trademark Act of 1946 and title 35 of the United States Code to change the name of the Patent Office to the "Patent and Trademark Office".

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Patent Office. Name change.

SECTION 1. The Trademark Act of 1946, 60 Stat. 427, as amended (15 U.S.C. sec. 1051 et seq. (1970)), and title 35 of the United States Code, entitled "Patents", are amended by striking out each time they appear "Patent Office" and "Commissioner of Patents" and inserting in lieu thereof "Patent and Trademark Office" and "Commissioner of Patents and Trademarks", respectively.

35 USC 1 et seq.

SEC. 2. Section 29 of the Trademark Act of 1946 is further amended by striking out "Reg. U.S. Pat. Off." and inserting in lieu thereof "Reg. U.S. Pat. & Tm. Off."

15 USC 1111.

SEC. 3. The terms "Patent Office" and "Commissioner of Patents" in all laws of the United States shall mean "Patent and Trademark Office" and "Commissioner of Patents and Trademarks", respectively.

35 USC 1 note.

SEC. 4. This Act shall become effective upon enactment. However, any registrant may continue to give notice of his registration in accordance with section 29 of the Trademark Act of 1946 (60 Stat. 427), as amended Oct. 9, 1962 (76 Stat. 769), as an alternative to notice in accordance with section 29 of the Trademark Act as amended by section 2 of this Act, regardless of whether his mark was registered before or after the effective date of this Act.

Effective date. 15 USC 1111 note.

Approved January 2, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 93-523 (Comm. on the Judiciary).
SENATE REPORT No. 93-1399 (Comm. on the Judiciary).
CONGRESSIONAL RECORD:
Vol. 119 (1973): Oct. 15, considered and passed House.
Vol. 120 (1974): Dec. 18, considered and passed Senate.

[931 O.G. 491]

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

Name Change

Pursuant to authority contained in 35 U.S.C. 6, as amended (85 Stat. 364), Chapter I of Title 37 of the Code of Federal Regulations is amended as follows:

The heading of Chapter I is changed to read as set forth above.

Wherever the name "Patent Office," and the title "Commissioner of Patents," appear in Chapter I, they are changed to read, respectively, "Patent and Trademark Office" and "Commissioner of Patents and Trademarks."

Public Law 93-596, 88 Stat. 1949, changed the name of the Patent Office to "Patent and Trademark Office," and the title of the Commissioner of Patents to "Commissioner of Patents and Trademarks."

It is the general policy of the Patent and Trademark Office to afford interested members of the public an opportunity to participate in the rulemaking process. However, this amendment is entirely editorial in nature. Therefore, the public rulemaking procedure is waived and this amendment will become effective on February 4, 1975.

C. MARSHALL DANN,
Commissioner of Patents.

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 40 F.R. 5158, Feb. 4, 1975

[932 O.G. 2 (Mar. 4, 1975)]

EXPRESS MAIL

The Patent and Trademark Office has made an arrangement with the U.S. Postal Service for the delivery of "Express Mail." This arrangement provides for the delivery of "Express Mail" to a Patent and Trademark Office employee in the Department of Commerce Building in Washington, D.C., thus guaranteeing delivery to us in the same manner as "Express Mail" is delivered to any other addressee in the city of Washington. "Exress Mail" requires the recipient to indicate both the time and date of delivery. The date which our employee in the Department of Commerce Building receives the mail will be the Official Office Receipt Date.

The address which should be used for "Express Mail" is:

Commissioner of Patents and Trademarks
Washington, D.C. 20231.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Feb. 11, 1975.

[932 O.G. 340]

EXPRESS MAIL

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department

of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

May 15, 1975.

[936 O.G. 1554]

POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557-3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766-2386.

ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265-4597.

ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526-6000.

BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962-3560.

BIRMINGHAM, ALA., 35205, Suite 200-201, 908 S. 20th St. (205) 325-3327.

BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223-2312.

BUFFALO, N.Y. 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842-3208.

CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343-6181, Ext. 375.

CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778-2151.

CHICAGO, 60603. Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353-4450.

CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (513) 684-2944.

CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522-4750.

COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765-5345.

DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749-1515.

DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837-3246.

DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284-4222.

DETROIT, 48226, 445 Federal Bldg. (313) 226-3650.

GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St. P.O. Box 1950. (919) 275-9111, Ext. 345.

HARTFORD, CONN., 06103, Room 610-B, Federal Office Bldg., 450 Main St. (203) 244-3530.

HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546-8694.

HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226-4231.

INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269-6214.

KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374-3142.

LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824-7591.

MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534-3213.

MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350-5267.

MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224-3473.

MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725-2133.

NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589-6546.

NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264-0634.

NEWARK, N.J., 07102, Gateway Bldg., (4th Floor) (201) 645-6214.

PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597-2850.

PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261-3285.

PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644-2850.

PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221–3001.

RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784–5203.

RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782–2246.

ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.

SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524–5116.

SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave. (415) 556–5860.

SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723–4640.

SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.

SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave., North (206) 442–5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

[937 O.G. 886]

NOTICE TO OFFICIAL GAZETTE SUBSCRIBERS

The Patent and Trademark Office announce a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

In case of complete stoppage, please send a copy of your order or expiration notice, together with proof of payment (copy of cancelled check or processed order), to Mr. S. J. Bania, Director, Office of Publications (Room 2–5C26), Patent and Trademark Office, Washington, D.C. 20231. Attention: Shirley A. Hammel (Telephone 703/557–3794), or Lillie M. Harrison (Telephone 703/557–1985).

This notice is effective with the publication date and supersedes the notice published on this subject in 934 O.G. 886, dated April 25, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Sept. 12, 1975.

[939 O.G. 3]

CUSTOMER RELATIONS CENTER

A Customer Relations Center, located in Crystal Plaza adjacent to the Public Search Room, Building 4, Rooms A102 and A103, has been established to provide a central customer complaint and inquiry service. The Center is staffed with six highly experienced employees who process inquiries concerning copies of U.S. patent documents previously ordered but not received. This Center handles not only walk-in but telephonic, and written requests for assistance as well. In addition to improving customer relations, this service is intended to relieve the primary customer service areas (Patent Copy Sales, Document Services, and Reference Order Branch), and Patent Office officials, or interruptions and irregular demands on their time.

The telephone number for this service is (703) 557–2003.

ROBERT GOTTSCHALK,
Acting Commissioner of Patents.

Nov. 26, 1971.

[893 O.G. 807]

(NOTE.—In the trademark area, this service pertains only to applications and file wrapper contexts of applications.)

RELOCATION OF CUSTOMER RELATIONS CENTER

In order to expand facilities in the Public Search Room of the Patent and Trademark Office, it has become necessary to relocate the Customer Relations Center.

As of January 19, 1976, the Center was moved to Building No. 2, Room 4C08. The telephone number of the Center will continue to be (703) 557–2003.

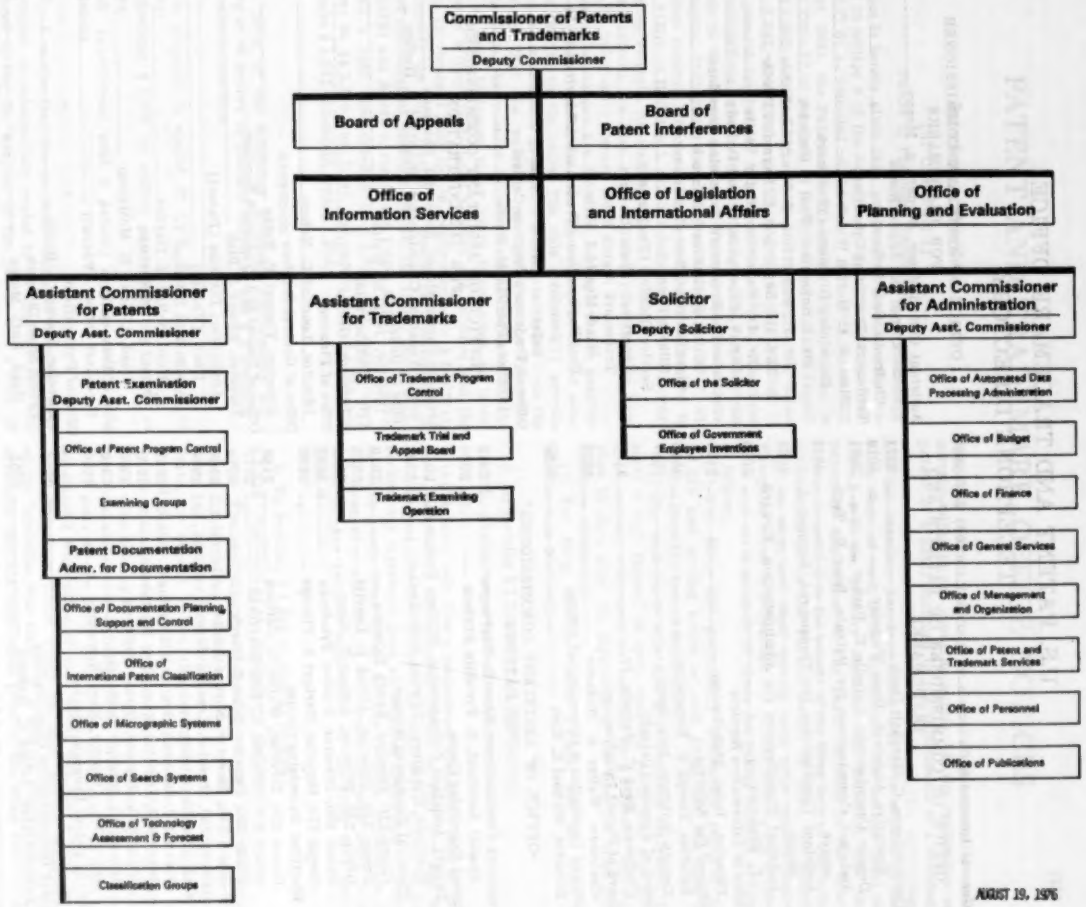
WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

January 1976.

[943 O.G. TM 61 (Feb. 10, 1976)]

Attachment to DOO 30-3B

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office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AUGUST 19, 1976

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U.S. PATENT AND TRADEMARK OFFICE
TELEPHONE DIRECTORY

General Information ..... (703) 557-3080

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PATENT AND TRADEMARK OFFICE NOTICES

Interference Practice

[37 CFR Part 1]

Notice of Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 92–132, 85 Stat. 364), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending §§ 1.205, 1.207, 1.215, 1.216, 1.217, 1.222, 1.223, 1.225, 1.245, 1.247, 3.44, 3.45 and 5.3 and by adding § 1.246.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before January 21, 1977. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. No oral hearing will be held.

This proposal has been reviewed and determined to have no major inflationary impact.

These rule changes are intended to improve the practice before the Board of Patent Interferences and to correct some inconsistencies in the rules. The rule changes (1) provide a patentee with notice as soon as a claim is copied from the patent so that the patentee can preserve the invention records from the moment he receives said notice until the time, in some instances many years later, when an interference is ultimately declared between the patentee and the copier, (2) bring § 1.207(b) in confirmity with § 1.207(a), (3) simplify the rules relating to preliminary statements in view of the decisions, *Reddy* v. *Davis*, 187 USPQ 386 (Comm. Dec. 1975) and *Reddy* v. *Dann*, 188 USPQ 644 (CCPA 1976), (4) fill a void now existing in § 1.225, (5) make minor changes in §§ 1.245 and 1.247 and create new § 1.246 and (6) make § 1.217 consistent with § 1.215.

ATTENTION

The texts of the following proposed amendments are using ► ◄ arrows to indicate additions and [ ] brackets to indicate deletions.

It is proposed to amend 37 CFR, Parts 1, 3 and 5 as follows:

1. Revising § 1.205 by adding paragraph (c) thereto as follows:

§ 1.205 *Interference with a patent; copying claims from patent.*

* * * * *

►(c) A notice that one or more claims of a patent have been copied, or substantially copied by an applicant(s), will be placed in the file wrapper of the patent and a copy of said notice will be sent to the patentee. However, the identity of the applicant(s) will not be disclosed to the patentee unless an interference is declared.◄

2. By revising § 1.207(b) to read as follows:

§ 1.207. *Preparation of interference papers and declaration of interference.*

* * * * *

(b) A patent interference examiner will institute and declare the interference by forwarding notices to the several parties to the proceeding. Each notice shall include the name and residence of each of the other parties and those of his attorney or agent, and of any assignee, and will identify the application of each opposing party by serial number and filling date, or in the case of a patentee by the number and date of the patent. The notices shall also specify the issue of the interference, which shall be clearly and concisely defined in only as many counts as may be necessary to define the interfering subject matter (but in the case of an interference with a patent all the claims of the patent which can be made by the applicant should constitute the counts), and shall indicate the claim or claims of the respective cases corresponding to the count or counts. [If the application or patent of a party included in the interference is a division, continuation or continuation-in-part of a prior application and the examiner has determined that it is entitled to the filing date of such prior application, the notices shall so state.] ►If the primary examiner has indicated that the patent or application of any party included in the interference is entitled to the benefit of the filing date of any prior applications as to the subject matter in issue, the notices shall so state and shall specify such prior applications.◄ Except as noted in paragraph (e) of this section, the notices shall also set a schedule of times for taking various actions as follows:

(1) For filing the preliminary statements required by § 1.215 and serving notice of such filing, not less than 2 months from the date of declaration.

(2) For each party who files a preliminary statement to serve a copy thereof on each opposing party who also files a preliminary statement as required by § 1.215(b), not less than 15 days after the expiration of the time for filing preliminary statements.

(3) For filing motions under § 1.231, not less than 4 months from declaration.

* * * * *

3. By revising § 1.215(b) to read as follows:

§ 1.215 *Preliminary statement required.*

* * * * *

(b) A party who files a preliminary statement shall at the same time notify all opposing parties of that fact and by the time set for that purpose he shall serve a copy of his preliminary statement [and all attached documents on every opposing party from whom he has received notification of the filing of a statement.] ►on every opposing party from whom he has received notification of the filing of a statement.◄

* * * * *

4. By revising § 1.216 to read as follows:

§ 1.216 *Contents of the preliminary statement.*

(a) The preliminary statement must state that the party made the invention set forth by each count of the interference, and whether the invention was made in the United States or abroad. When the invention was made in the United States the preliminary statement must set forth as to the invention defined by each count the following facts:

(1) The date upon which the [first drawing of the invention was made; if a drawing of the invention has not been made prior to the filing date of the application, it must be so stated.] ►invention of each count was conceived.◄

(2) The date [upon which the first written description of the invention was made; if a written description of the invention has not been made prior to the filing date of the application, it must be so stated.] ►after conception of said invention when active exercise of reasonable diligence toward reducing the invention to practice began.◄

(3) The date [upon which the invention was first disclosed to another person; if the invention was not disclosed to another person prior to the filing date of the application, it must be so stated.] ►of the actual reduction to practice of the invention; if the invention has not actually been reduced to practice before the filing date of the involved application, it must be so stated.◄

[(4) The date of the first act or acts susceptible of proof (other than making a drawing or written description or disclosing the invention to another person) which, if proven, would establish conception of the invention, and a brief description of such act or acts; if there have been no such acts, it must be so stated.

(5) The date of the actual reduction to practice of the invention; if the invention has not been actually reduced to practice before the filing date of the application, it must be so stated.

(6) The date after conception of the invention when active exercise of reasonable diligence toward reducing the invention to practice began.]

Paragraph (b) is deleted and present paragraph (c) is substituted as new paragraph (b) as follows:

[(b) When an allegation as to the first drawing (paragraph (a)(1) of this section) and/or as to the first written description (paragraph (a)(2) of this section) is made, a copy of such drawing and/or written description must be attached to the statement. (See § 1.223(c).)]

[(c)] ►(b)◄ If a party intends to rely solely on a prior application, domestic or foreign, and on no other evidence, the preliminary statement may so state and need not be signed or sworn to or declaration made by the inventor.

5. By revising § 1.217 to read as follows:

§ 1.217 *Contents of the preliminary statement; invention made abroad.*

[(a)] When the invention was made abroad the facts specified by § 1.216(a)(1) to [(6)] ►(3)◄ are not required, and in lieu thereof there should be stated:

(1) When the invention was introduced into this country by or on behalf of the party, giving the circumstances with the dates connected therewith which are relied upon to establish the fact and, when appropriate, including allegations of activity in this country of the nature of that represented by § 1.216(a)(1) to [(6)] ►(3).◄ [and documentary attachments if the allegations relate to a drawing or written description.] ►Such statement may be signed and sworn to, or made in the form of a declaration, either by the inventor or by one authorized to make the statement and having knowledge of the facts alleged therein.◄

(2) If a party is entitled to the benefit of the second sentence of 35 U.S.C. 104, he must so state and his preliminary statement must include allegations of activity abroad corresponding to those required by § 1.215(a) (1) to [(6)] (3).

6. By revising § 1.222 to read as follows:

§ 1.222 *Correction of statement on motion.*

In case of material error arising through inadvertence or mistake, the statement [or attachments] may be corrected [or omitted attachments may be supplied on motion] (see § 1.243), upon a satisfactory showing that such action is essential to the ends of justice. The motion must be made, if possible, before the taking of any testimony, and as soon as practicable after the discovery of the error.

7. By revising § 1.223(c) to read as follows:

§ 1.223 *Effect of statement.*

* * * * *

(c) If a party to an interference fails to file a statement, testimony will not be received subsequently from him to prove that he made the invention at a date prior to his effective filing date. [If a party alleges in his statement a date of first drawing or first written description but does not attach a copy of such drawing or written description as required by § 1.216(b), he will be restricted to his effective filing date as to that allegation unless such copy is admitted by motion under § 1.222.]

* * * * *

8. By revising § 1.225 to read as follows:

§ 1.225. *Failure of junior party to file statements or to overcome filing date of senior party.*

If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the effective filing date of the application of another party, judgment on the record will be entered against such junior party unless he has filed a proper motion under § 1.231, within the time set for such motions, seeking some action in the interference. If such motion has been timely filed but does not result in action in the interference which removes the basis for a judgment on the record, such judgment will be entered unless the motion related to a matter which may be reviewed at final hearing under § 1.258, and within 30 days of the decision denying his motion, or a later time set by the patent interference examiner, the junior party concerned requests that final hearing be set to review such matter. ►If, as a result of a decision on motion, the original senior party is deprived of the benefit of an earlier filed application and is thereby made a junior party and if in addition he relies solely on said earlier filed application in his preliminary statement, he stands in the same position as a junior party whose statement fails to overcome the effective filing date of the senior party as in the first sentence of § 1.225.◄ Also, such a junior party may within such 30 day period, or time set, request a final hearing to review such a matter raised by his opposition to a motion under § 1.231(a), (2), (3), (4), or (5) which was granted over his opposition. Such a junior party will not be permitted to take testimony except on granting of a motion accompanied by a showing of good cause, which should normally include names of proposed witnesses and affidavits or declarations by them giving their expected testimony.

9. Revising § 1.245 by deleting the second sentence thereof so as to read as follows:

§ 1.245 *Extension of time.*

Extensions of time in any case not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extention. [A motion not timely made may be considered upon a showing of sufficient cause as to why such motion was not timely presented.]

10. By adding new rule § 1.246 as follows:

►§ 1.246. *Late papers.*

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§ 1.68), of sufficient cause as to why such motion or paper was not timely presented.◄

11. Revising the format of § 1.247 so as to read as follows:

§ 1.247 *Service of papers.*

►(a)◄ Every paper filed in the Patent and Trademark Office in interference proceeding must be served upon the other parties in the manner provided in § 1.248, except the following:

[(a)] ►(1)◄ Preliminary statements at the time of filing but see § 1.215(b) and (c).

[(b)] ►(2)◄ Documentary exhibits introduced at the taking of a deposition.

[(c)] ►(3)◄ Certified transcripts of testimony under § 1.276 (but copies of the record must be served (§ 1.253(a)).

[(d)] ►(4)◄ Statutory disclaimers under 35 U.S.C. 253.

►(b)◄ The specification in certain sections that a designated paper must be served does not imply that other papers, not expected above need not be served. However, the requirement for service of designated papers may be waived under particular circumstances and service may be required of other designated papers which need not ordinarily be served. Proof of service must be made before the paper will be considered in the interference by the Office. A statement of the attorney, attached to or appearing in the original paper when filed, clearly stating the time and manner in which service was made will be accepted as prima facie proof of service.

12. By revising § 3.44 to read as follows:

§ 3.44 *Interference; preliminary statement of domestic inventor.*

Preliminary statement

_____
v. Interference No. _____
_____
_____ ss
_____, being duly sworn (or affirmed), deposes and says that he is a party to the above identified interference, that he made the invention set forth by [the counts] ►each count◄ of the interference in the United States; that

(1) [The first drawing of the invention was made] ►The invention of each count was conceived◄ on _____, 19_____ [A copy is attached.[3]]

(2) [The first written description of the invention was made] ► Active exercise of reasonable diligence toward reducing the invention to practice began◄ on _____, 19_____ [A copy is attached.[3]]

(3) The invention was [first disclosed to others] ►actually reduced to practice◄ on _____, 19_____.[3]

[(4) The date of the first act or acts susceptible of proof, other than acts of the character specified in (1), (2), and

(3) which, if proven, would establish conception of the invention, and a brief description of such act or acts are (e.g. the making of a non-operating model on _____, 19____).

(5) The invention was actually reduced to practice on _____, 19____.

(6) Active exercise of reasonable diligence toward reducing the invention to practice began on _____, 19____.[1]]

_____
(Signature of inventor)

Subscribed and sworn to (or affirmed) before me this ____date of _____, 19____.

[SEAL]

_____
(Signature of notary public officer)

_____
(Official character)

13. Revising § 3.45 by changing line 3 of the last paragraph of the section.

§ 3.45 *Interference; preliminary statement of foreign inventor.*

* * * * *

* * * When acts were performed in the United States corresponding to the allegations (1) through [(6)] ►(3)◄ in the preliminary statement of a domestic inventor (§ 3.44) these acts should be included by appropriate allegations in the preliminary statement of a foreign inventor.

14. Revising § 5.3(b) by adding a third sentence as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

(b) * * * An interference will not be declared involving applications under secrecy order. However, if an application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent. ►See § 1.205(c).◄

* * * * *

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: November 19, 1976.

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.76-35049; Filed 11-29-76; 8:45 am]

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[1]If there were no act corresponding to this allegation prior to the filing date of the application, it must be so stated. [Note, however, date of completion of application drawing and specification, date of disclosure to person preparing the application, and diligence in preparing the application.]

Extension of Deadline for Comments on Proposed Interference Rules

The deadline for comments on the proposed rules relating to patent interferences announced in the Federal Register of November 30, 1976 (41 F.R. 52486) and reproduced in this issue of the OFFICIAL GAZETTE is being extended through March 4, 1977.

C. MARSHALL DANN,
Dec. 13, 1976. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,611,813, Sharpless and Eichert, Jr., MAGNETIC DATA STORAGE SYSTEM, **filed** Nov. 20, 1976, D.C., N.D. Ill. (Chicago) Doc. 70c2916, *Technitrol, Inc.* v. *Digital Equipment Corporation.* Above entitled cause of action is dismissed without prejudice, July 26, 1976.

2,891,375, Vandamme, and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH-BULK YARN; **3,012,397,** H. Sarvage, METHOD OF MAKING HIGH-BULK YARNS; **3,165,881,** De Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; **3,232,037,** H. Crouzet, FALSE-TWIST SPINDLE; **3,584,456,** same, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, **filed** Aug. 24, 1976, D.C., M.D.N.C. (Greensboro) Doc. C-76-441-G, *Deering Milliken Research Corporation and Chavanoz, S.A.* v. *American Textured Yarn Company and Carolina American Textiles, Inc.* **Same, filed** Sept. 16, 1976, D.C., M.D.N.C. (Greensboro) Doc. C-76-492-G, *Deering Milliken Research Corporation and Chavanoz, S.A.* v. *J. P. Stevens & Company, Inc.*

2,891,375, Vandamme and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH-BULK YARNS; **3,165,881,** De Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; **3,232,037,** H. Crouzet, FALSE-TWIST SPINDLE; **3,584,450,** same, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, **filed** Sept. 9, 1976, D.C., M.D.N.C. (Greensboro) Doc. C76-478-G, *Deering Milliken Research Corporation and Chavanoz, S.A.* v. *Spray Textured Yarns, Inc.*

2,897,641, Simon and Thomas, PACKAGING METHODS, **filed** Mar. 10, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c0770, *Instapak Corporation* v. *Haeger Potteries, Inc.* Enter order by stipulation that causes are dismissed with prejudice, Aug. 23, 1976.

2,985,245, R. P. Maloof, PROPELLER FAN; **Reg. No. 788,-738** (TROPIC-BREEZE), National Frost Protection, Inc., now SSP Agricultural Equipment, Inc., **filed** Apr. 4, 1974, D.C., E.D. Wash. (Spokane) Doc. C-74-86, *SSP Agricultural Equipment, Inc.* v. *Orchard-Rite Ltd.* Plaintiff's third proposed findings of fact and conclusions of law and judgment entered Aug. 18, 1976.

3,012,397. (See 2,801,375.)

3,014,994, S. Posen, EYEGLASS HEARING AID CONSTRUCTION; **3,209,080,** Guttner, Starke and Sapara, ELECTRICAL HEARING AID, **filed** Feb. 2, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c296, *Siemens Aktiengesellschaft* v. *Sonotone Corporation.* On stipulation cause dismissed with prejudice, Apr. 6, 1976.

3,039,670, F. T. Hardon, COLLAPSIBLE CONTAINER, **filed** Dec. 9, 1975, D.C., S.D.N.Y., Doc. 75-C-6178 RO, *Packaging Corporation of America* v. *Lionel Industries Company, Inc.* Consent judgment entered permanently enjoining defendants from further infringing on plaintiff's said patent, Sept. 3, 1976.

3,086,529, Munz and Kelson, CONSTRICTORS, **filed** July 13, 1976, D.C.N.J. (Newark) Doc. 76-1370, *Propper Manufacturing Co., Inc.* v. *FJR Company.* Action dismissed by plaintiff, Aug. 27, 1976.

3,165,881. (See 2,891,375.)

3,174,688, V. H. Chatten, ORNAMENTAL DEVICE USING LIQUID DROPLETS, **filed** Sept. 27, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c2796, *Creators, Inc.* v. *Montgomery Ward & Co., Incorporated and The Wickes Corporation.* Complete case file transferred to Central District of California, July 11, 1975.

3,176,491, Mau and Nagy, THREAD AND OTHER FORM ROLLING DIES; **Re. 26,518,** same, **filed** Sept. 1, 1976, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati) Doc. 75-2010, *The National Rolled Thread Die Company* v. *E. W. Ferry Screw Products, Inc. et al.* The decision of the District Court is affirmed, Sept. 1, 1976. **Same, filed** Sept. 1, 1976, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati) Doc. 75-2011, *The National Rolled Thread Die Company* v. *E. W. Ferry Screw Products, Inc. et al.* The decision of the District Court is affirmed.

3,249,026, Curlett and Gurries, CONSTRUCTION MACHINES, **filed** Jan. 13, 1972, D.C., N.D. Ill. (Chicago) Doc. 72c106, *CMI Corp.* v. *Lakeland Construction Co. et al.* Cause dismissed, Jan. 23, 1975; appealed, Feb. 21, 1975; appeal affirmed, Apr. 16, 1976.

3,268,539, H. I. Henderson, APPARATUS FOR DRILLING WELLS, **filed** Sept. 3, 1976, D.C. Colo. (Denver) Doc. 76-M-872, *Walker-Neer Manufacturing Company, Inc.* v. *Drill Systems, Inc. et al.*

3,200,080. (See 3,014,994.)

3,232,037. (See 2,891,375.)

3,400,038, C. D. Burgess, SEAMING TAPE; **3,533,876,** same, PROCESS FOR FACE SEAMING CARPETING; **3,563,830,** C. D. Burgess, PROCESS FOR PREPARING SEAMING TAPE, **filed** Aug. 31, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76-2802-LTL, *Carpet Seaming Tape Licensing Corp.* v. *H. B. Fuller Company.*

3,400,038, C. D. Burgess, SEAMING TAPE; **3,533,876,** same, PROCESS FOR FACE SEAMING CARPETING; **3,563,830,** C. D. Burgess, PROCESS FOR PREPARING SEAMING TAPE; **3,755,058,** A. Winkler, CARPET SEAMING TAPE, **filed** Aug. 5, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–2494–R, *Carpet Seaming Tape Licensing Corp.* v. *Vectron Industries, Inc.*

3,486,283, R. W. Arnett, SOFFIT MOLDING; **3,606,714,** same, MOLDING STRIP FOR USE AS QUIRK OR REVEAL, **filed** June 8, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–992A, *Fry Reglet Corporation and R. W. Arnett* v. *R. G. Barnett Corporation, R. G. Barnett and Elaine Barnett.* Consent dismissal entered by clerk dismissing action, Sept. 17, 1976.

3,533,876. (See 3,400,038.)

3,563,830. (See 3,400,038.)

3,584,450. (See 2,891,375.)

3,586,794, E. Michaelis, EARPHONE HAVING SOUND DETOUR PATH, **filed** July 24, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c1880, *Sennheiser Electronic Corp.* v. *Allied Radio Shack et al.* Judgment by consent, complaint against Tandy Corp. is dismissed without prejudice; Tandy Corp's counterclaim against Sennheiser Electronic Corp. is dismissed without prejudice. Said patent is valid and belongs to plaintiff, Mar. 27, 1975.

3,602,181, G. H. Harris, OUTBOARD MOTOR STEERING CONTROL, **filed** Aug. 30, 1976, D.C., W.D. La. (Shreveport) Doc. 760916–S, *Garrett W. Harris and Arnold Industries, Inc.* v. *T. Lloyd Co. et al.*

3,606,714. (See 3,486,283.)

3,669,499, Semplonius and Kolk, CHAIR, **filed** May 10, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c1207, *Steelcase, Inc.* v. *All-Steel Equipment Inc.* Plaintiff's voluntary dismissal, June 4, 1973.

3,713,926, L. Speer, METHOD FOR PATCHING MATERIALS, **filed** Mar. 18, 1976, D.C., N.D. Ohio (Toledo) Doc. 76–129, *Vyna-Chem (Canada), Ltd.* v. *Lawrence L. Speer et al.* Case dismissed for want of prosecution without prejudice, Sept. 13, 1976.

3,727,949, Kleykamp, Neroni and Holden, HOSE CONSTRUCTION, **filed** Sept. 14, 1976, D.C., E.D. Mo. (St. Louis) Doc. 76–834C(3), *Arundale, Inc.* v. *Dayco Corporation.*

3,732,419, Kulberg and Muehlehner, SCINTILLATION CAMERA WITH IMPROVED RESOLUTION, **filed** Nov. 18, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c3327, *Searle Analytic, Inc.* v. *Ohio Nuclear, Inc.* Plaintiff's voluntary dismissal on Mar. 20, 1975.

3,733,211, F. R. Anderson, RIBBON-INKING METHOD, **filed** June 23, 1976, D.C.N.J. (Newark) Doc. 76–1209, *Henry Bridgman* v. *Berkeley Bio-Engineering, Inc.* Plaintiff's notice of voluntary dismissal of action, Sept. 14, 1976.

3,739,653, D. Bogosh, SPEEDOMETER DRIVES, **filed** May 29, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c1467, *Donald Bogosh* v. *Stewart-Warner Corporation.* Enter consent order, cause hereby dismissed without prejudice, Oct. 29, 1974.

3,742,908, D. H. Merino, ANIMAL HABITAT, **filed** Apr. 1, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c1037, *Mattel, Inc.* v. *Petè International Ltd. Inc. and Genyk Products Limited.* Stipulated dismissal on Mar. 4, 1976.

3,754,279, Valenti and Follett, THERMAL RECORDER HAVING ANALOGUE STYLUS AND PRINT HEAD, **filed** May 17, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c1350, *General Electric Co.* v. *Gulton Industries.* By stipulation, order complaint dismissed with prejudice and counterclaim dismissed without prejudice, Nov. 26, 1974.

3,755,058. (See 3,400,038.)

3,854,910, P. A. Hammerquist, APPARATUS FOR REMOVING PARTICLES FROM AN AIRSTREAM, **filed** Aug. 31, 1976, D.C. Oreg. (Portland) Doc. C–76–766, *American Sheet Metal, Inc. and Peter A. Hammerquist* v. *Clarke's Sheet Metal, Inc.*

3,901,396, C. E. Rhodes, POWER CONTROL HAND TRUCK, **filed** Sept. 7, 1976, D.C. Minn. (Minneapolis) Doc. 4–76–C–399, *Woodward Mfg. & Sales Co., Inc.* v. *Anthony Fox, The Tony Team, Inc. and Qwik-Lift, Inc.*

3,914,493, Graber and Tischer, IRON-IN STIFFENING INSERT, **filed** Sept. 15, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–1520A, *Pelton Corporation* v. *Staflex Co.*

3,955,609, M. I. Stiegel, HANDBAG, **filed** Aug. 26, 1976, D.C., S.D. Calif. (Los Angeles) Doc. CV76–2766–WPG, *AMBA Marketing Systems, Inc.* v. *United States Sales Corp.*

Re. 26,518. (See 3,176,491.)

Reg. No. 788,738. (See 2,985,245.)

PATENT NOTICES

Certificates of Correction for the Week of Jan. 4, 1977

Re. 28,805	3,948,153	3,974,069	3,984,609
Re. 28,907	3,948,995	3,974 676	3,984,757
Re. 28,962	3,950,388	3,974,873	3,984,845
Re. 28,972	3,951,273	3,974,939	3,985,041
3,792,334	3,951,351	3,975,153	3,985,083
3,809,930	3,951,502	3,975,219	3,985,086
3,817,809	3,951,745	3,975,300	3,985,470
3,824,517	3,953,436	3,975,302	3,985,550
3,831,753	3,954,125	3,975,343	3,985,826
3,833,476	3,954,493	3,975,437	3,985,886
3,850,202	3,954,702	3,975,723	3,985,940
3,851,500	3,955,297	3,976,031	3,986,065
3,856,817	3,956,269	3,976,646	3,986 198
3,868,075	3,956 293	3,976,648	3,986,270
3,871,852	3,957,328	3,977,136	3,986,328
3,875,917	3,960,562	3,977,607	3,986,465
3,879,367	3,962,086	3,978,054	3,986,654
3,898,435	3,962,361	3,978,511	3,986,833
3,907,834	3,962,364	3,979,331	3,987,026
3,909,652	3,963,633	3,979,359	3,987,047
3,912,687	3,964,313	3,979,530	3,987,073
3,913,225	3,964,488	3,979,670	3,987,197
3,915,135	3,965,042	3,980,136	3,987,203
3,919,722	3,965,748	3,980,542	3,987,470
3,921,862	3,966,418	3,980,586	3,987,618
3,927,358	3,966,859	3,980,801	3,987,777
3,927,503	3,966,865	3,980,802	3,987,833
3,927,692	3,967,366	3,980,870	3,988,001
3,927,984	3,967,465	3,981,358	3,988,056
3,928,171	3,967,559	3,981,804	3,988,259
3,928,959	3,967,579	3,981,897	3,988,339
3,929,047	3,968,310	3,982,021	3,988,347
3,932,446	3,968,468	3,982 035	3,988,395
3,933,515	3,968,469	3,982,249	3,988,481
3,934,020	3,968,517	3,982,866	3,988,608
3,934,586	3,968,518	3,982,969	3,989,168
3,936,178	3,969,582	3,982,988	3,989,346
3,936,725	3,969,755	3,983,093	3,989,522
3,937,757	3,970,098	3,983,102	3,989,546
3,938,626	3,970,126	3,983,162	3,989,569
3,938,638	3,970,245	3,983,687	3,989,624
3,941,570	3,971,145	3,983,698	3,990,436
3,942,645	3,971,398	3,983,806	3,990,462
3,943,099	3,971,520	3,983,865	3,991,049
3,944,393	3,971,826	3,984,198	3,991,194
3,945 968	3,972,027	3,984,307	3,991,235
3,947,380	3,972,822	3,984,479	3,991,270
3,947,649	3,972,868	3,984,570	

Errata

All reference to Patent No. 3,994,393 to Billy N. Nilson of Sweden for Two Chamber Package appearing in the OFFICIAL GAZETTE of November 30, 1976 should be deleted since no patent was granted.

All reference to Patent No. 3,995,511 to Arthur E. Bishop of Australia for Improvements in or Relating to Rack and Pinion Steering Gear Automotive Vehicles appearing in the OFFICIAL GAZETTE of December 7, 1976 should be deleted since no patent was granted.

All reference to Patent No. 3,995,854 to Jack S. Gasaway of California for Coin Controlled Support for Game Net appearing in the OFFICIAL GAZETTE of December 7, 1976 should be deleted since no patent was granted.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for U.S. and possibly foreign licensing, in accordance with the policies of the agency sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications, either paper copy (PC) or microfiche (MF), can be purchased at the prices cited from the National Technical Information Service (NTIS), Springfield, Va. 22161. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 687,283. Ejector Rack. Filed May 17, 1976. PC $4.00/MF $3.00.

Patent 3,957,356. System for Simulating Missile Target Motion Using Steering Mirrors. Filed Mar. 28, 1975. Patented May 18, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 689,895. Internal Calibration System. Filed May 25, 1976. PC $4.00/MF $3.00.

Patent 3,881,968. Incendiary Comprising Naphthalene and MG-Tetrafluoroethylene. Filed June 22, 1973. Patented May 6, 1975. Not available NTIS.

Patent 3,900,872. Radar Data Converter and Display System. Filed June 27, 1967. Patented Aug. 19, 1975. Not available NTIS.

Patent 3,903,521. Simulator of Radar Return Signals From an Accelerating Target. Filed July 9, 1964. Patented Sept. 2, 1975. Not available NTIS.

Patent 3,904,964. Parametric Amplifier Alignment System. Filed Mar. 7, 1974. Patented Sept. 9, 1975. Not available NTIS.

Patent 3,904,966. Synchronized Turn-Off of VLF Antennae. Filed Jan. 31, 1972. Patented Sept. 9, 1975. Not available NTIS.

Patent 3,917,927. Automatic Ranging Frequency Counter. Filed Apr. 15, 1974. Patented Nov. 4, 1975. Not available NTIS.

Patent 3,921,014. Bounce Drive System. Filed Oct. 23, 1973. Patented Nov. 18, 1975. Not available NTIS.

Patent 3,927,552. Underwater Strain Sensor. Filed Nov. 20, 1974. Patented Dec. 23, 1975. Not available NTIS.

Patent 3,935,440. Catapult Breakaway Load Simulator Circuit. Filed Jan. 30, 1975. Patented Jan. 27, 1976. Not available NTIS.

Patent 3,936,834. High Powered Ferrite Loaded Helicopter Antenna. Filed June 21, 1972. Patented Feb. 3, 1976. Not available NTIS.

Patent 3,938,183. Magnetic Tape Signature Signal Injection Device. Filed Oct. 3, 1974. Patented Feb. 10, 1976. Not available NTIS.

Patent 3,940,455. Hydrocarbon Polymers. Filed Aug. 31, 1970. Patented Feb. 24, 1976. Not available NTIS.

Patent 3,942,010. Joule-Thomson Cryostat Cooled Infrared Cell Having a Built-In Thermostat Sensing Element. Filed May 9, 1966. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,942,150. Correction of Spatial Non-Uniformities in Sonar, Radar, and Holographic Acoustic Imaging Systems. Filed Aug. 12, 1974. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,942,447. Fuzing System. Filed Apr. 18, 1967. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,510. Pulse-Repetition Frequency Discriminator (PRFD) for Tracking Radar Signals. Filed Oct. 2, 1964. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,515. Counter-Countermeasure Guidance System. Filed Apr. 24, 1962. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,952,664. Rocket Nozzle Multi Function. Filed June 10, 1974. Patented Apr. 27, 1976. Not available NTIS.

Patent 3,956,453. Process for Fabricating One-Piece Rocket Motor Heat Barrier. Filed Dec. 3, 1973. Patented May 11, 1976. Not available NTIS.

Patent 3,956,711. Traveling Wave Transverse Electron Beam for Laser Pumping. Filed Nov. 23, 1973. Patented May 11, 1976. Not available NTIS.

Patent 3,956,749. Bearing Measurement Device for a Portable Attack Warning Radar. Filed Apr. 16, 1973. Patented May 11, 1976. Not available NTIS.

Patent 3,957,294. Rotary Gas Joint. Filed June 6, 1974. Patented May 18, 1976. Not available NTIS.

Patent 3,964,696. Method for Controlling the Spin Rate of Tube Launched Rockets. Filed Oct. 30, 1974. Patented June 22, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 700,673. A Method for Measuring Biaxial Stress in a Body Subjected to Stress Inducing Loads. Filed June 28, 1976. PC $3.50/MF $3.00.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,940,892. Self-Erecting Aircraft Structure. Filed May 23, 1974. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,954,293. Self-Protecting Latch. Filed Apr. 29, 1974. Patented May 4, 1976. Not available NTIS.

Patent 3,957,107. Thermal Switch. Filed Feb. 27, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,959,446. Synthesis of High Purity, Alpha Phase Silicon Nitride Powder. Filed Mar. 1, 1974. Patented May 25, 1976. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg. Agricultural Research Service, Hyattsville, Md. 20782

Patent application 697,174. Methanol Treated Activated Sludge as an Agricultural Chemical Carrier. Filed June 17, 1976. PC $4.00/MF $3.00.

Patent application 698,632. Veterinary Ocular Ring Device for Sustained Drug Release. Filed June 22, 1976. PC $3.50/MF $3.00.

Patent application 699,920. Acetoxymethyl Derivatives of Polyunsaturated Fatty Triglycerides as Primary Plasticizers for Polyvinylchloride. Filed June 25, 1976. PC $4.00/MF $3.00.

Patent application 701,057. Lubricant Compositions. Filed June 30, 1976. PC $3.50/MF $3.00.

Patent 3,959,312. Synthesis of Antitumor Alkaloid Deoxyharringtonine and Its Precursor 3'-O-(5-Methyl 2-Oxohexanoyl)-Cephalotaxine. Filed Dec. 20, 1974. Patented May 25, 1976. Not available NTIS.

Patent 3,959,468. Antibiotic Equisetin and Method of Production. Filed May 6, 1974. Patented May 25, 1976. Not available NTIS.

Patent 3,968,094. Photodegradable Plastics Containing Haloolefins. Filed Nov. 26, 1974. Patented July 6, 1976. Not available NTIS.

Patent 3,968,095. Photodegradable Plastics Containing an N-Palo Amide. Filed May 30, 1975. Patented July 6, 1976. Not available NTIS.

Patent 3,968,096. Photodegradable Polyolefins Containing and Halogenated Nitrile. Filed Aug. 8, 1975. Patented July 6, 1976. Not available NTIS.

Patent 3,968,234. Cinnamyl-Sesamol Derivatives as Insect Chemosterilants. Filed Mar. 5, 1975. Patented July 6, 1976. Not available NTIS.

Patent 3,973,040. Certain Cinnamyl Phenols as Growth Inhibitors for Mosquito Larvae. Filed July 8, 1975. Patented Aug. 3, 1976. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 571,502. Assay Medium and Method for Identification of Non-Fermentative Gram-Negative Bacteria (NFB). Filed Apr. 25, 1975. PC $3.50/MF $3.00.

Patent application 701,190. Large Unilamellar Vesicles (LUV). Filed June 30, 1976. PC $3.50/MF $3.00.

Patent application 707,759. Display Enhancement Technique for Video Moving Trace Display. Filed July 22, 1976. PC $3.50/MF $3.00.

Patent 3,969,240. Polysiloxane Membrane Lung. Filed Feb. 3, 1975. Patented July 13, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 680,840. Satellite Up Link Diversity Switch. Filed Apr. 28, 1976. PC $3.50/MF $3.00.

Patent application 685,964. Protective Paint for Application Underwater. Filed May 13, 1976. PC $3.50/MF $3.00.

Patent 3,870,906. Ramp/Hold Circuit. Filed June 21, 1973. Patented Mar. 11, 1975. Not available NTIS.

Patent 3,893,120. Omnidirectional Ring Antenna for EW Amplitude Comparison Direction Finding. Filed Aug. 13, 1970. Patented July 1, 1975. Not available NTIS.

Patent 3,898,636. Solid State Control and Display Board. Filed May 2, 1974. Patented Aug. 5, 1975. Not available NTIS.

Patent 3,904,891. Logic Circuit for True and Complement Digital Data Transfer. Filed June 25, 1971. Patented Sept. 9, 1975. Not available NTIS.

Patent 3,907,947. Method for Shaped Charge Bomblet Production. Filed Nov. 12, 1973. Patented Sept. 23, 1975. Not available NTIS.

Patent 3,925,558. Use of Obtusaquinone as a Fungicide to Control Wood-Inhabiting Marine Fungi. Filed Oct. 25, 1974. Patented Dec. 9, 1975. Not available NTIS.

Patent 3,940,970. Eyeletting Attachment for Drill Presses. Filed May 12, 1975. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,947,127. Optical Component Functional Tester. Filed Nov. 11, 1974. Patented Mar. 30, 1976. Not available NTIS.

Patent 3,956,801. Adjustable Staking Tool. Filed Feb. 7, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,957,340. Electrooptical Amplitude Modulator. Filed Feb. 25, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,957,341. Passive Frequency-Selective Optical Coupler. Filed Sept. 3, 1974. Patented May 18, 1976. Not available NTIS.

Patent 3,965,448. Waveguide Isolator With Damping Means. Filed May 7, 1975. Patented June 22, 1976. Not available NTIS.

TENNESSEE VALLEY AUTHORITY
Division of Law
Muscle Shoals, Ala. 35660

Patent 3,975,178. Purification of Wet-Process Phosphoric Acid With Methanol and Ammonia. Filed May 28, 1974. Patented Aug. 17, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 619,471. Method of Producing I–123. Filed Oct. 3, 1975. PC $3.50/MF $3.00.

Patent application 681,017. Three-Dimensional Tracking Solar Energy Concentrator and Method for Making Same. Filed Apr. 28, 1976. PC $3.50/MF $3.00.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,624,772. Reading and Writing Machine Using Raised Patterns. Patented Nov. 30, 1971. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 4, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-30-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-4-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-14-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-22-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-22-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-2-76

Expiration of patents: The patents within the range of numbers indicated below expire during December 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,914,768 to 2,919,442 inclusive
Plant Patents..... Numbers 1,882 to 1,892, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JANUARY 4, 1977

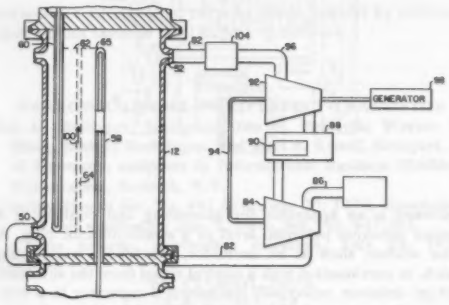
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T954,001
FLUID CIRCULATION SYSTEM FOR HEAT EXCHANGERS

James D. Mangus, Hemfield Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1975, Ser. No. 603,076
Int. Cl.² F01K *25/08*; F28D *15/00*
U.S. Cl. 60—682
5 Sheets Drawing. 16 Pages Specification



A fluid circulation system for heat exchangers having two groups of tubes through which primary and secondary fluids flow, the tubes of one group being interdigitated with the tubes of the other group, and a heat transfer material interposed between the two groups of tubes, whereby heat is transferred from the primary fluid through the heat transfer material to the secondary fluid. A shell forms a closure around the tubes of the heat transfer material, and the shell has tertiary fluid inlet and outlet means. Openings in the heat transfer material form passageways through which the tertiary fluid can flow from the inlet means, through the heat exchanger, to the outlet means. Piping connects the tertiary fluid outlet means to the tertiary fluid inlet means, forming a complete cycle. Installed in this piping is a heat removal system. If the secondary fluid flow is interrupted, the tertiary fluid provides a redundant means by which the heat of the primary fluid can be removed from the heat exchanger. Monitoring means can be inserted into the piping, to detect any leakages which may occur in the primary and secondary tubes. Condensers or desiccating material can be installed in the heat removal means to remove any liquids which may leak into the tertiary fluid. Additionally, if the tertiary fluid is a gas or vapor, a turbine can be inserted into the piping and the tertiary fluid's power utilized to provide energy to power the compressor or pump which is circulating the tertiary fluid. In an emergency, this turbine can be connected to an electrical generator and provide emergency power to the rest of the plant.

T954,002
PROCESS FOR INCREASING MASK LIFE

Paul P. Castrucci; Robert H. Collins, both of Poughkeepsie, and Frank T. Deverse, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 436,320, Jan. 24, 1974, abandoned, which is a continuation of Ser. No. 195,876, Nov. 4, 1971, abandoned, which is a continuation of Ser. No. 699,268, Jan. 19, 1968, abandoned. This application Feb. 17, 1976, Ser. No. 659,177
Int. Cl.² G03C *5/00*
U.S. Cl. 96—38.3
1 Sheet Drawing. 16 Pages Specification

A method for semiconductor device manufacture comprising the steps of, (a) repetitively aligning photomasks over a surface of a semiconductor substrate, said substrate having a layer of opaque material on said surface, said opaque material being adapted to receive and retain a photographic pattern; and (b) at least one of said steps employing a photomask of a particular construction, said particularly constructed photomask being placed in physical contact with said opaque material, said particularly constructed photomask essentially consisting of a planar glass substrate having a thickness of approximately 0.25 inches, one surface of said glass substrate having a thin film of chrome thereon, said thin film of chrome having a thickness of approximately 0.1 microns, said thin film of chrome having a photographic pattern formed therein, a layer of SiO_2 fully covering said thin film of chrome and said surface of said glass substrate, said SiO_2 layer having a thickness of approximately 3,000 angstroms, whereby the useful life of said particularly constructed photomask is materially extended and said method for semiconductor device manufacture is rendered less costly and more efficient.

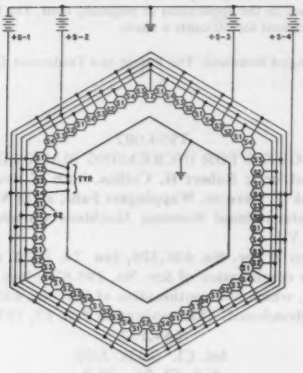
T954,003
REACTIVITY CONTROL SYSTEM FOR NUCLEAR REACTORS BY MAGNETIC MEANS

Demetrios L. Basdekas, Rockville, Md., and George I. Bell, Los Alamos, N. Mex., assignors to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

Continuation of Ser. No. 439,791, Feb. 5, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,438
Int. Cl.² G21C *7/10*
U.S. Cl. 176—86 R
6 Sheets Drawing. 13 Pages Specification

A reactor control system comprising stationary control elements placed at the periphery of the reactor core is utilized to provide reactivity control of the reactor. The stationary control elements comprise electromagnets with a magnetic core surrounded by a plurality of windings which may readily be magnetized by electric current. The magnetic field generated therein has the effect of altering the neutron polarization in its vicinity, thereby changing the neutron diffusion coefficient and thus reflectivity of the magnetic control elements. The net

effect is a change in the core reactivity proportional to the magnetic field strength. In addition to reactor control this



system is intended to provide a protective function by reactor shutdown.

T954,004

PROCESS FOR PREPARING CONTAINERS USING POLYESTERS

William C. Dickason, 2005 Green Lane; Winston J. Jackson, Jr., 4408 Green Springs Circle, both of Kingsport, Tenn. 37664, and Willis C. Wooten, Jr., 521 Lakewood Road, Kingsport, Tenn. 37660

Filed June 7, 1976, Ser. No. 693,450

Int. Cl.² B29C *17/07*

U.S. Cl. 264—98

No Drawing. 5 Pages Specification

Disclosed is a process for preparing containers, such as bottles, using a polyester of terephthalic acid, ethylene glycol, and 1,4-cyclohexanedimethanol, wherein the 1,4-cyclohexanedimethanol is from 25 to 40 mole percent of the diol. A molten parison of such polyester is extruded and then expanded in a mold to form the desired container.

T954,005

PROCESS FOR PREPARING CONTAINERS USING BRANCHED POLYESTERS

Burns Davis, 2019 Bruce St., Kingsport, Tenn. 37664; James R. Overton, 840 Ridgefields Road, and Roger M. Schulken, Jr., 2113 Heatherly Road, both of Kingsport, Tenn. 37660

Filed May 24, 1976, Ser. No. 689,224

Int. Cl.² B29C *17/07*

U.S. Cl. 264—98

No Drawing. 9 Pages Specification

Disclosed is a process for preparing containers, such as bottles, using a branched polyester of terephthalic acid, a combination of ethylene glycol and 1,4-cyclohexanedimethanol and a small amount of a polyfunctional branching compound. A molten parison of such polyester is extruded and then expanded in a container mold to form the desired container.

T954,006

ON-CHIP SUBSTRATE VOLTAGE GENERATOR

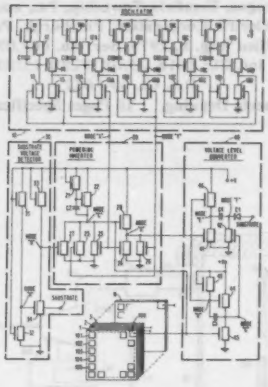
James M. Lee, Wappingers Falls, and George Sonoda, Poughkeepsie, both of N.Y., assignors to International Business Machines, Armonk, N.Y.

Continuation of Ser. No. 567,213, April 11, 1975, abandoned, which is a continuation of Ser. No. 375,271, June 29, 1973, abandoned. This application Apr. 2, 1976, Ser. No. 672,898

Int. Cl.² H03K *3/353*

U.S. Cl. 307—304

3 Sheets Drawing. 17 Pages Specification



Disclosed is an apparatus for generating and controlling a desired substrate potential level or a semiconductor chip. A pulse source, such as an oscillator, provides a pulse train which, in combination with a control signal from the substrate voltage detector, selectively discharges a capacitor in a voltage level converter for obtaining a desired level of substrate potential. A feedback path through the substrate regulates the conductivity of a reference transistor in the substrate voltage detector providing the required control signal.

T954,007

SIGNAL ENHANCEMENT SYSTEM FOR RADAR DISPLAY

Robert Y. Nevin, New Hartford, N.Y., and James Allen Scheer, Stone Mountain, Ga., assignors to General Electric Company

Filed Dec. 2, 1975, Ser. No. 636,890

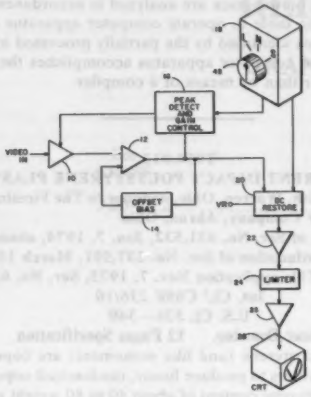
Int. Cl.³ G01S *7/06;* **H01J** *29/52*

U.S. Cl. 343—17

5 Sheets Drawing. 15 Pages Specification

A system is provided for matching the dynamic range of a radar signal to the dynamic range of the CRT on which it is displayed. A variable gain amplifier **10** receives the radar video signal which it supplies to buffer amplifier **12** and offset bias circuit **14** which maintain the most negative portions of the video signal at the zero volt level, corresponding to black on the CRT display. The most positive portion of the video signal at the output of amplifier **12** is compared by peak-detect and gain control circuit **16** against a reference level, manually set by control unit **18**, and the error between the two is used to adjust the gain of amplifier **10**. The zero-based peak-controlled signal is presented to DC restore circuit **20** which includes an analog switch that is controlled by control unit **18**. Buffer amplifier **22** passes the output from circuit **20** to a limiter circuit **24** which passes only those portions of the signal existing between zero and the reference level. The output from limiter circuit **24** is passed by an output buffer amplifier **26** to the CRT **28** for display. Weak portions of the

video signal (small targets) are thus enhanced by passing the signal directly through circuit 20, and the resolution is increased for strong signal portions (large targets) by switching such signals through the DC restore network.



T954,008

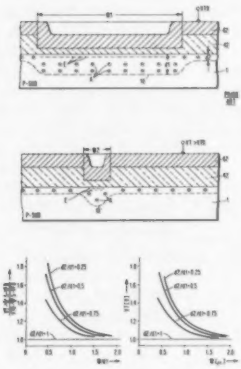
NARROW CHANNEL FIELD EFFECT TRANSISTOR

Utz G. Baitinger, Stuttgart; Otto G. Folberth; Werner O. Haug, both of Boeblingen, and Karl E. Kroell, Stuttgart, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 481,016, June 20, 1974, abandoned. This application Jan. 7, 1976, Ser. No. 647,251

Claims priority, application Germany, July 28, 1973, 2338388

Int. Cl.² H01L *29/78*
U.S. Cl. 357—23
4 Sheets Drawing. 21 Pages Specification



A field effect transistor having a channel width of such small dimension that threshold voltage becomes inversely related to channel width allowing the fabrication of field effect transistors of differing threshold voltages while using the same process steps. Reduced threshold voltage due to prior art "short channel length" effect may be offset by the presently disclosed narrow channel width effect. Desired chanel impedance values are achieved independently of threshold voltage influence due to narrow channel width effect by the provision of parallel-connected field effect transistors of the same channel length whose total channel widths yield a desired net width-to-length ratio.

T954,009

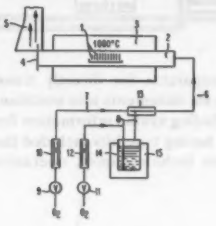
METHOD FOR THE THERMAL OXIDATION OF SILICON WITH ADDED CHLORINE

Konrad Malin, Dettenhausen, and Dietrich Seybold, Boeblingen, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 439,491, Feb. 4, 1974. This application July 16, 1975, Ser. No. 596,498

Claims priority, application Germany, Mar. 24, 1973, 2314746

Int. Cl.² B05D *5/12*
U.S. Cl. 427—93
1 Sheet Drawing. 11 Pages Specification



The dry thermal oxidation of silicon semiconductor material to produce an oxide layer, such as the gate oxide of a field effect transistor, is carried out by flowing oxygen over the surface of the semiconductor at an elevated temperature to form a layer of silicon oxide. The electrical properties of the layer are improved by adding chlorine to the oxygen in the form of between 0.2 and 5.0 mol % of carbon tetrachloride in order to introduce chlorine into the growing oxide layer.

T954,010

METHOD OF COATING OXIDIZED INORGANIC SUBSTRATES WITH POLYIMIDE

Friedrich C. Brunner, Sindelfingen; Peter U. Frasch; Friedrich W. Schwerdt, both of Boeblingen, and Theodor P. Vogtmann, Holzgerlingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 492,319, July 26, 1974, abandoned. This application May 19, 1976, Ser. No. 687,965

Claims priority, application Germany, Aug. 24, 1973, 2342801

Int. Cl.² B05D *3/04*, *3/10*
U.S. Cl. 427—335
No Drawing. 12 Pages Specification

Substrates with oxidized surfaces, as e.g. SiO_2 layers on silicon semiconductors and aluminum surfaces, are wetted with an organic silicon compound, for example, γ-aminopropyltriethoxysilane dissolved in an organic solvent such as trichlorotrifluoro ethane. The solvent is then removed in a dry atmosphere. The evaporation step can be carried out by suspending the substrate in volvent vapor over a supply of refluxing solvent while cooling the solvent vapor such that fresh, dry solvent vapor continuously passes along the substrate and absorbs traces of moisture. Subsequently, a coating is applied from a solution of a polyamido carbon acid formed of pyromellitic acid anhydride and an aromatic amino component and the polyamido carbon acid is heated to form an adherent layer of polyimide.

T954,011

METHOD AND APPARATUS FOR OPERATING COMPUTER APPARATUS IN RESPONSE TO PROGRAM STATEMENTS

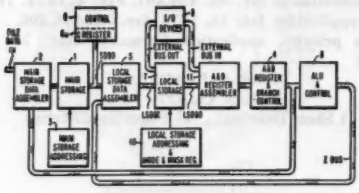
Anthony Hassitt, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 129,739, March 31, 1971. This application Feb. 18, 1975, Ser. No. 550,387

Int. Cl.² G06F *9/06*

U.S. Cl. 444—1

2 Sheets Drawing. 51 Pages Specification



Method and apparatus for directly translating higher-level language program statements into machine readable form, the translation including syntax information for each item of each statement and having type bits included therein to indicate its type. The types include names, operators and literals. The translated items are then sequentially scanned and the type bits analyzed to partially process the machine readable items and supply the partially processed information to a stack. The top two items on the stack are analyzed in accordance with a syntax decision table to operate computer apparatus to conduct operations identified by the partially processed information. Thus, the computer apparatus accomplishes the syntax analysis rather than by means of a compiler.

T954,012

TRANSPARENT IMPACT POLYSTYRENE PLASTICS

Robert C. Smith, Warren, Ohio, assignor to The Firestone Tire and Rubber Company, Akron, Ohio

Continuation of Ser. No. 431,532, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 237,591, March 15, 1972, abandoned. This application Nov. 7, 1975, Ser. No. 630,060

Int. Cl.² C08F *236/10*

U.S. Cl. 526—340

1 Sheet Drawing. 12 Pages Specification

Butadiene and styrene (and like monomers) are copolymerized with modifiers to produce linear, randomized copolymers with a block styrene content of about 40 to 80 weight per cent and a bound styrene content of about 70 to 95 per cent. They are sufficiently free of block butadiene to be transparent. Such copolymers are plastic rather than elastomeric, and have high elongations as compared with those usually associated with copolymers of such high styrene content. Also, they have very high impact resistance.

REISSUE PATENTS

GRANTED JANUARY 4, 1977

ERRATA

For CLASS	See PATENT NO.
526–022	29,100

REISSUES

JANUARY 4, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

NOTE.—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

Re. 29,095
TAKE-UP SPOOL LATCH

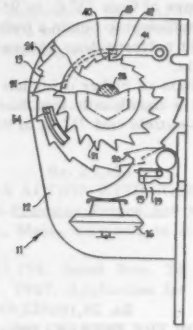
Robert Boyson Heath, St. Marys, Australia, assignor to Rainsfords Metal Products Proprietary Ltd., Australia

Original No. 3,834,646, dated Sept. 10, 1974, Ser. No. 303,965, Nov. 6, 1972. Application for reissue May 5, 1975, Ser. No. 574,708

Claims priority, application Australia, Nov. 9, 1971, 6940/71

Int. Cl.[2] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.7 **19 Claims**



17. In a seat belt retractor having a seat belt carried upon a take-up spool, a spool retracting spring for normally biasing said spool in a belt retracting direction and thereby normally imparting tension to the seat belt when it is placed in use, and a spool locking means for locking the spool against belt withdrawal under emergency conditions, the improvement comprising the provision of:

pawl and ratchet means associated with said spool independent of said spool locking means for preventing retraction of said belt under urging of said spring; and

means driven by rotation of said spool for operating said pawl and ratchet means to prevent belt retraction under urging of said spring in response to spool rotation imparted by a retraction movement of a withdrawn belt followed by a subsequent further limited withdrawal movement of said belt, said driven means including means for de-activating said pawl and ratchet means to allow retraction of said spool under the urging of said spring in response to a still further withdrawal movement of said belt beyond said limited withdrawal of said belt.

Re. 29,096
BRAKE SYSTEMS

Roger D. Jones, Ramsey, N.J., assignor to Abex Corporation, New York, N.Y.

Original No. 3,844,624, dated Oct. 29, 1974, Ser. No. 391,850, Aug. 27, 1973. Application for reissue Jan. 22, 1976, Ser. No. 651,477

Int. Cl.[2] **B60T** *8/18*

U.S. Cl. 303—100 **30 Claims**

1. In a braking system where brake pressure is applied by fluid-operated pistons in related brake cylinders:

an accumulator for storing fluid under pressure;

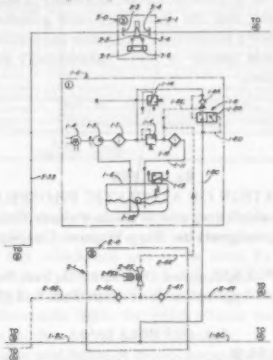
a reservoir for storing fluid not under pressure;

a pump means communicating with said accumulator and said reservoir for delivering fluid from said reservoir to charge said accumulator with fluid;

a continuously variable directional valve interposed between said brake cylinders, said accumulator, and said reservoir, said directional valve being settable in a first position allowing fluid from said accumulator to communicate with said brake cylinders, and being settable in a second position allowing fluid from said brake cylinders to communicate with said reservoir, and a null position blocking flow between the accumulator and brake cylinders and between the brake cylinders and the reservoir;

a control system line communicating with said accumulator, said reservoir and with said directional valve, capable of providing a first pilot pressure urging said directional valve to said first position, and capable of allowing flow of fluid from said accumulator to said reservoir;

a main control valve interposed in said control system line to variably restrict or enlarge flow through said control system line from said accumulator to said reservoir to vary said first pilot pressure;



[an orifice interposed between said directional valve and said brake cylinders;]

a release means capable of providing a second force in opposition to the force of said first pilot pressure, and urging said directional valve to said second position;

a control means which controls said main control valve so that when brake pressure is to be applied, said main control valve restricts flow through said control system line thereby increasing the force from said first pilot pressure above the force from said release means causing said directional valve to be set in said first position, and so that when brake pressure is to be released, said main control valve enlarges flow through said control system line thereby decreasing the force from said first pilot pressure below the force from said release means causing said directional valve to be set in said second position.

Re. 29,097
GLASS PLATE EDGE GRINDING MACHINE

Shigeru Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd., Tokushima, Japan

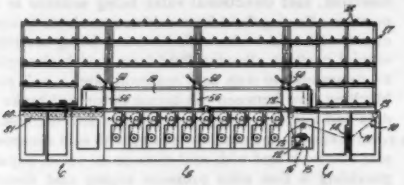
Original No. 3,841,027, dated Oct. 15, 1974, Ser. No. 430,689, Jan. 4, 1974. Application for reissue Jan. 16, 1976, Ser. No. 649,903

Int. Cl.[2] **B24B** *9/00*

U.S. Cl. 51—110 **6 Claims**

6. A glass plate edge grinding machine for grinding the lower edge of a glass plate by means of a plural number of grinding wheels arranged in a series, with said glass plate being held between and transported in a horizontal direction by a pair of

belt conveyors each comprising an endless belt in such a manner that the glass plate is slightly inclined with respect to a vertical plane and supported at said inclined surface by a plural number of backing-up rollers, the belt of one belt conveyor being supported by a plural number of pressing members arranged in a series inside said belt while the belt of the conveyor which is disposed on the opposite side of the glass plate from the grinding wheel is supported by a rigid backing-up plate disposed inside



said belt, the pressing members pressing against the belt of said one belt-conveyor and the glass plate to force the glass plate against the belt of the other belt-conveyor and the backing-up plate and to maintain the portion of the glass plate adjacent the grinding wheel in a smooth curve extending away from the pressing members, and the spindle of each grinder holding a grinding wheel being supported by a spindle supporting assembly which enables said spindle to move substantially in the radial and axial directions.

Re. 29,098

PREPARATION OF ALIPHATIC PHOSPHATES

Ingenuin Hechenbleikner, and William Palmer Enlow, both of Chicago, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Original No. 3,923,620, dated Dec. 2, 1975, Ser. No. 507,632, Sept. 20, 1974. Application for reissue Feb. 6, 1976, Ser. No. 655,648

Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **7 Claims**

1. A process for preparing aliphatic phosphates comprising introducing oxygen into a mixture of a trialkenyl or trialkyl phosphite and a source of free radicals, at a temperature below about 80° C and in the presence of light of wavelength of 2000–4000A°.

Re. 29,099

HEAT STABILITY OF ASBESTOS-FILLED POLYPROPYLENE

John H. Kietzman, Golden, and Mario P. Tocci, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Original No. 3,799,906, dated Mar. 26, 1974, Ser. No. 197,508, Nov. 10, 1971. Application for reissue Apr. 16, 1976, Ser. No. 677,594

Int. Cl.² C08K *9/04*

U.S. Cl. 260—42.45 **10 Claims**

1. A process of producing an asbestos reinforced, heat-stabilized polypropylene article comprising:

(a) admixing at a temperature above about 400° F. a mixture comprising, in parts by weight [per 100 parts by weight of polypropylene], 1 to 2 parts of polyester forming organic acid of acid anhydride having a melting point of 250°–550° F.; 1 to 2 parts of a polyhydric alcohol having a melting point of from 250°–550° F.; 10 to 40 parts of asbestos fiber; and *sufficient* polypropylene resin *to make a total of 100 parts of admixture*; and

(b) molding the admixture to produce a heat-stabilized article.

Re. 29,100

SELECTIVE HYDROPEROXIDATION OF POLYOLEFINS IN AN AQUEOUS SLURRY

Tad L. Patton, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Original No. 3,870,692, dated Mar. 11, 1975, Ser. No. 161,819, July 12, 1971. Continuation-in-part of Ser. No. 633,789, April 26, 1967, abandoned. Application for reissue Sept. 2, 1975, Ser. No. 609,284

Int. Cl.² C08F *110/06, 8/06*

U.S. Cl. 526—22 **14 Claims**

1. A process for selective hydroperoxidation of finely divided solid polypropylene particles, which consists essentially of:

contacting a cationic surfactant-free, slurry of said polypropylene, having a particle size of about 30 to 1,000 microns in water with a 50 to 90 mg. of ozone per liter of air mixture as the sole free radical initiator, at a temperature within the range of from 75° C. to 95° C.,

and for a time sufficient to obtain a hydroperoxide concentration in said polypropylene between 0.014 and 0.050 weight percent,

whereby formation of higher oxidation products than hydroperoxides is significantly less than said formation at temperatures outside said 75° C. to 95° C. range.

Re. 29,101

METHOD FOR THE PREPARATION OF CARBON MOLDINGS AND ACTIVATED CARBON MOULDING THEREFROM

Yasuo Amagi; Yasushi Nishimura, and Yasuo Uehara, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha and Toyo Boseki Kabushiki Kaisha, both of Tokyo, Japan

Original No. 3,917,806, dated Nov. 4, 1975, Ser. No. 401,160, Sept. 27, 1973. Application for reissue Mar. 18, 1976, Ser. No. 668,202

Claims priority, application Japan, Sept. 30, 1972, 47-97650

Int. Cl.² C01B *31/02, 31/10;* **B01J** *21/18*

U.S. Cl. 423—449 **10 Claims**

1. A method of converting pitch into a formed porous carbon material, including the steps of forming pitch into shapes, oxidizing the formed shapes at a temperature of room temperature to 400° C to make the pitch infusible, and carbonizing the infusibilized shaped pitch in an inert atmosphere at a temperature higher than 600° C, wherein the improvement comprises the combination of steps of:

a. selecting a hydrocarbon pitch starting material having a softening point of 50°–350° C., a carbon content of 80–97, a hydrogen/carbon ratio of 0.3–2.5, and a nitrobenzene-insoluble fraction of less than 60%;

b. mixing said pitch starting material prior to said forming step with from 5 to 50 parts by weight of aromatic hydrocarbon per 100 parts of said pitch, said aromatic hydrocarbon being those having a boiling point of at least 200° C. and containing from 2 to 3 aromatic rings, said mixing being carried out with sufficient heating to form a fluidized mix which is subjected to said forming step to obtain said formed shapes; and

c. contacting the thus-produced formed shapes with a liquid organic solvent in which said aromatic hydrocarbon is soluble, said solvent being further characterized by the property that said pitch is substantially insoluble therein, said contacting extracting said aromatic hydrocarbon to increase the porosity of said formed shapes prior to said steps of oxidizing and carbonizing thereof.

Re. 29,102

CONTRACEPTION AGENT

Arthur Scherm, Bad Hamburg, Germany, assignor to Merz & Co., Frankfurt, Germany

Original No. 3,876,757, dated Apr. 8, 1975, Ser. No. 341,877, Mar. 16, 1973. Application for reissue Apr. 2, 1976, Ser. No. 672,881

Claims priority, application Germany, Mar. 21, 1972, 2213604

Int. Cl.² A61F *15/00*; A61K *11/02*, *9/02*

U.S. Cl. 424—44 12 Claims

1. In a spermicidally active vaginal suppository consisting essentially of spermicide, a suppository base comprising a water-soluble polyethylene glycol, foaming agent, and foam-stabilizing agent, wherein the spermicide is an alkylphenoxypolyethoxyethanol, the improvement which comprises (1) the employment of about 65 to 85 percent by weight of a water-soluble polyethylene glycol which is meltable at body temperature as the suppository base and (2) about 10 to 20 percent by weight of a mixture of tartaric acid and sodium bicarbonate as the foaming agent.

Re. 29,103

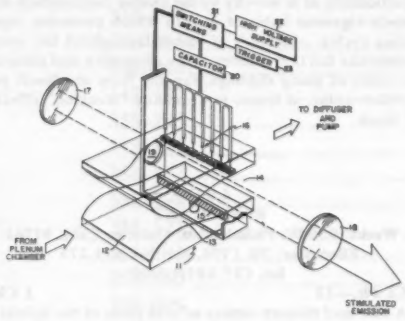
NITROGEN LASER ACTION WITH SUPERSONIC FLOW

Jack Wilson, Aix-en-Provence, France, and Arthur R. Kantrowitz, Cambridge, Mass., assignors to Avco Corporation, Cincinnati, Ohio

Original No. 3,543,179, dated Nov. 24, 1970, Ser. No. 613,236, Feb. 1, 1967. Application for reissue Nov. 24, 1972, Ser. No. 309,126

Int. Cl.² H01S *3/09*

U.S. Cl. 331—94.5 PE 7 Claims



1. The method of light generation by stimulated emission of radiation in an optical cavity which comprises the steps of:

first, passing a supersonic flow of the working medium in a direction orthogonal to the axis of the cavity, and

second, electrically pumping the medium to induce lasing action.

Re. 29,104

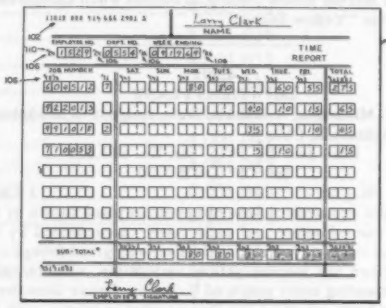
METHOD OF SCANNING DOCUMENTS TO READ CHARACTERS THEREON WITHOUT INTERFERENCE FROM VISIBLE MARKS ON THE DOCUMENT WHICH ARE NOT TO BE READ BY THE SCANNER

David H. Shepard, Rye, N.Y., assignor to Cognitronics Corporation, Stamford, Conn.

Original No. 3,820,067, dated June 25, 1974, Ser. No. 172,924, Aug. 18, 1971. Continuation of Ser. No. 876,694, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 701,670, Jan. 30, 1968, Pat. No. 3,582,884, which is a continuation-in-part of Ser. No. 523,367, Jan. 27, 1966, abandoned. Application for reissue Nov. 11, 1974, Ser. No. 522,686

Int. Cl.² G06K *7/14*

U.S. Cl. 340—146.3 B 2 Claims



1. The method of machine reading of characters placed on a document form having pre-printed thereon markings visible to the eye but which are not to be read by the character reading machine, said method comprising the steps of:

producing by means of a laser small-diameter beam of monochromatic light, the width of said beam being small relative to the size of said characters;

presenting to said beam of monochromatic light a document form having said characters in place on a reflective background and carrying said pre-printed markings in a color related to said monochromatic light such that said beam produces from said markings a reflected light intensity equal to the intensity of reflected light said beam produces from said background, whereby said markings and said background are not distinguishable with respect to the light reflected from said document form in response to impingement of said monochromatic light beam;

scanning said document by sweeping said narrow beam [at] along a series of consecutive, adjacent paths intersecting said character and said markings;

developing signals representing the amount of light reflected from said document at evenly-spaced points along the scan path throughout the regions of said document containing said characters; and

analyzing said developed signals to determine the nature of the characters on said document.

PLANT PATENTS

GRANTED JANUARY 4, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,001
CHRYSANTHEMUM PLANT NAMED IMPROVED YELLOW DIGNITY

Robert E. Danielson, West Chicago, Ill., assignor to Pan American Plant Company, West Chicago, Ill.

Filed Aug. 18, 1975, Ser. No. 605,557
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct variety of chrysanthemum morifolium substantially as herein shown and described, characterized by the more intense yellow color if its blooms when compared to the cultivar "Yellow Dignity".

4,002
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 28, 1976, Ser. No. 653,019
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct form of impatiens plant known by the cultivar name Fanfare and particularly characterized by the combined characteristics of distinctive deep green foliage with a very clean cut interior yellow variegation; self-branching habit presenting many points of flowering; flower diameter of 3 cm. to 4 cm.; medium red flower color in winter, with the interior of the petals being light red to pink, with the summer flower color being light red with the interior fading to nearly white; superior outdoor growth habit in full sunlight; normal rooting habit; good durability, and above average production of number of cuttings at each node.

4,003
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Feb. 9, 1976, Ser. No. 656,654
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—19 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very vigorous, upright and very symmetrical habit of growth; large-leafed and waxy foliage; very large and many-petaled flowers; a distinctive and attractive soft pink flower color; and an extraordinary flower fragrance in the nature of a heavy permeating perfume.

4,004
CHRYSANTHEMUM PLANT

Grace H. Mack, New Canaan, Conn.; William E. Duffett, Akron, and Walter H. Jessel, Jr., Doylestown, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 18, 1976, Ser. No. 658,851
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—75 1 Claim

1. A new and distinct cultivar chrysanthemum known by the cultivar name Nuggets and characterized particularly as to uniqueness by the combined characteristics of flat inflorescence form; pompon inflorescence type; golden yellow inflorescence color; diameter across face of inflorescence from 1.25 to 1.5 inches; permanence of inflorescence ranging from 14 to 21 days; medium plant height; semi-spreading branching pattern; average natural season flowering date of Oct. 5; and average flowering response period of 7 weeks in photoperiodic controlled flowering programs.

4,005
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 18, 1976, Ser. No. 658,852
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—75 1 Claim

1. A new and distinct cultivar of chrysanthemum known by the cultivar name Revere and characterized particularly as to uniqueness by the combined characteristics of flat inflorescence form, reflexing slightly at maturity; pompon inflorescence type; two-toned red bronze and yellow bronze inflorescence color; diameter across face of inflorescence up to 2.75 inches; permanence of inflorescence ranging from 14 to 21 days; medium plant height; semi-upright branching pattern; average natural season flowering date of September 30 and average flowering response period of 7 weeks in photoperiodic controlled flowering programs.

4,006
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Mar. 22, 1976, Ser. No. 668,975
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extremely vigorous habit of growth which promotes repeat blooming cycles; constancy of bloom throughout the year; a carnation-like full flower form; and a distinctive and attractive flower color of many shadings, ranging from an almost pure pale yellow color, at times, to a definite "freckled" effect at other times.

4,007
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Mar. 29, 1976, Ser. No. 671,273
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—12 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of strong, extremely thorny stems carrying a great many thorns, flowers or large, many petaled and excellent substance, with vivid red and yellow bi-coloring.

4,008
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Mar. 29, 1976, Ser. No. 671,272
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—12 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extremely vigorous habit of growth; production of large flowers of exhibition form and which are mostly borne singly on exceptionally long stems; a distincitive and attractive pink and white flower color blend; and a strong flower fragrance.

PATENTS

GRANTED JANUARY 4, 1977

ERRATA

For CLASS	See PATENT NO.
308–035	4,000,559
427–022	4,000,957
427–389	4,000,958
029–115	4,000,979
106–054	4,001,019
429–067	4,001,036
429–188	4,001,037
429–046	4,001,039
429–015	4,001,040
429–019	4,001,041
427–115	4,001,042
429–206	4,001,043
429–166	4,001,044
200–061.45 R	4,001,185
526–026	4,001,193
526–240	4,001,194
526–348	4,001,195
526–348	4,001,196
536–017	4,001,208
536–017	4,001,209
536–084	4,001,210
536–084	4,001,211
148–187	4,001,465
358–283	4,001,492
358–127	4,001,493
358–127	4,001,494
358–294	4,001,495
358–127	4,001,496
358–101	4,001,497
358–160	4,001,498
358–093	4,001,499
358–282	4,001,500
358–160	4,001,501
358–165	4,001,502
358–243	4,001,503
235–070 A	4,001,551
270–053	4,001,596
310–009.5	4,001,767

PATENTS

GRANTED JANUARY 4, 1977

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

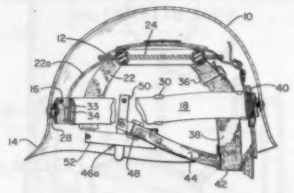
GENERAL AND MECHANICAL

4,000,520

HEADGEAR SUPPORT SYSTEM

Noel A. Svendsen, Bedford, and Willard G. Sylvester, Concord, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 21, 1975, Ser. No. 561,008
Int. Cl.² A42B *3/00*
U.S. Cl. 2—418 **5 Claims**



1. In a rigid headpiece having an internal suspension for supporting the headpiece in spaced relation to a wearer's head the improvement comprising:

an elongated nape strap disposed adjacent the rear portion of said headpiece for contacting the nape of the wearer's neck, the ends of said strap being disposed adjacent respective sides of said headpiece; and

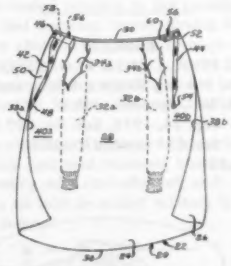
means coupling at least one end of said nape strap to a corresponding side of said headpiece, and comprising variable tension means including at least one lever arm cooperative with a ratchet bar and movable between a first position wherein said nape strap is tensioned and locked in a tensioned state so that said wearer's head can be locked within said headpiece between said suspension and said nape strap and a second position wherein said nape strap is relaxed so that said wearer's head can be easily positioned in and removed from said suspension.

4,000,521

DISPOSABLE GARMENT AND METHOD

Richard L. Zoephel, Lake Villa, and James H. Bolker, Barrington, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Nov. 5, 1975, Ser. No. 628,852
Int. Cl.² A41D *9/00*
U.S. Cl. 2—114 **30 Claims**



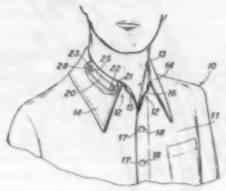
1. A sterile disposable garment comprising, a gown having a back, a front, a pair of side margins adjacent side edges of the gown, a pair of sleeves, and strap means extending from the gown adjacent one of said side margins and defining an opening to receive the wearer's arm and retain said one side margin in position on the wearer while passing the remainder of the gown around the wearer.

4,000,522

SHIRT COLLAR STRAP

Arthur P. Swanson, 1454 Estate Lane, Glenview, Ill. 60025

Filed Feb. 25, 1976, Ser. No. 661,357
Int. Cl.² A41B *3/02*
U.S. Cl. 2—141 R **6 Claims**



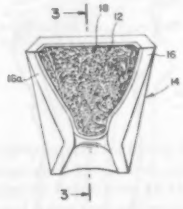
1. A front-button shirt having a discrete upstanding neck band with an attached, turned-down collar on the top end of the neck band adapted to be worn in a closed-collar position with a necktie and in an open-collar position without exposing a button, a fastening attachment for the button, or a buttonhole at the neck band, said neck band being free from a button and buttonhole at its ends, an elongated tab having a first end rotatably mounted on the neck band near but spaced sufficiently from one end of the neck band to be covered by the collar, said tab having a buttonhole in a second opposite end thereof, a first button on the same end of the neck band spaced from the rotatably mounted end of the tab a sufficient distance to be seated in the buttonhole of the tab to hold the tab flat against the neck band under the collar to be completely hidden in the open-collar position, and a second button on the opposite end of the neck band but spaced from said end to be covered by said collar, whereby said tab is adapted to be unbuttoned from said first button, rotated to extend over the opposite end of the neck band and receive the second button in the buttonhole thereof to hold the ends of the neck band in overlapped, closed-collar position.

4,000,523

NECKTIE AND KNOT ARTICLE

Walter Woods, New York, N.Y., assignor to Lawrene Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 17, 1976, Ser. No. 667,569
Int. Cl.³ A41D *25/02*
U.S. Cl. 2—150 **4 Claims**



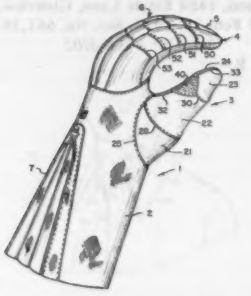
1. A necktie supporting attachment comprising an inverted frusto-conical shaped member having an inner and outer surface, said member being rigid and including a pair of lateral flanges, each member of said pair defining two converging planes, a median wall communicating between said planes at the point of convergence thereof, said inner surface on one side of said median wall including a plurality of hooked pile fabric members, said fabric members defining projecting adjacent, barbed splines having hooked end portions adapted to engage said necktie.

4,000,524

ARTICULATED GLOVE CONSTRUCTION

Dixie L. Rinehart, Aspen, Colo., assignor to Comfort Products, Inc., Aspen, Colo.

Filed Aug. 14, 1975, Ser. No. 604,711
Int. Cl.² A41D *19/00*
U.S. Cl. 2—161 R 5 Claims



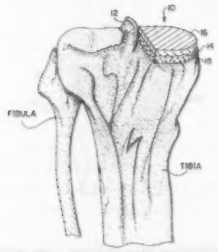
1. A glove construction having a conformal thumb portion, said glove construction comprising a gauntlet portion adapted to fit the palm of the wearer and having an aperture therein for receiving a thumb of the wearer, a metacarpal thumb portion joined to said gauntlet portion around a part of the periphery of said aperture and adapted to engage the front of the thumb of the wearer extending along the thumb metacarpal bone, a first phalanx portion joined to said metacarpal portion and joined to said gauntlet portion along a part of the periphery of said aperture and adapted to engage the front of the thumb of the wearer along the first thumb phalanx, a second phalanx portion joined to said first phalanx portion and adapted to engage the front of the thumb of the wearer along the thumbnail portion, and a front thumb portion joined at one end to said gauntlet around a part of said aperture and at another end to said second phalanx portion.

4,000,525

CERAMIC PROSTHETIC IMPLANT SUITABLE FOR A KNEE JOINT PLATEAU

Jerome J. Klawitter, Clemson, S.C., and Nazir A. Bhatti, Augusta, Ga., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1975, Ser. No. 606,630
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.911 7 Claims



7. A completely ceramic prosthesis for use as a bone implant in a joint comprising:

a. a layer of high aluminum oxide material having a porosity in the range of 40–60% with interconnecting pores;

b. said layer having a planar surface; and

c. a dense layer of high aluminum oxide material having a porosity not greater than 1% laminated to said first porous layer at said planar surface;

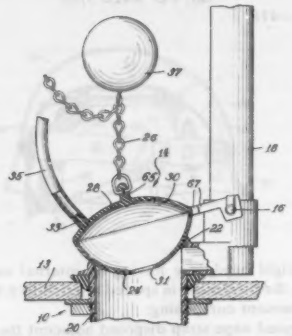
d. the outer surface of said dense layer being smooth to act as an articulate surface in said joint.

4,000,526

TOILET FLUSHING APPARATUS

John A. Biela, 9296 Callero Drive, Niles, Ill. 60648, and H. Paul Weirich, Box 164 Rte. 1, Libertyville, Ill. 60048

Filed Mar. 26, 1975, Ser. No. 562,311
Int. Cl.² E03D *1/34, 1/14, 3/12*
U.S. Cl. 4—57 P 10 Claims



1. In toilet flushing apparatus including a toilet tank drain valve seat, a flush valve assembly comprising:

floating means for sealing the drain valve seat, said means including a float chamber for trapping air therein to delay for a given time delay interval the closing of said floating means over the drain valve seat, said means further including an inlet mounted in fluid communication with said chamber, said inlet being disposed within an area surrounded by the valve seat engaging portion of said floating means when it engages said drain valve seat; and

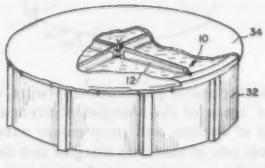
means defining at least one vent opening mounted in fluid communication with said chamber and disposed within said area for releasing trapped air from said chamber to decrease the time for closing of said floating means over the drain valve seat when said floating means is moved away from said valve seat, said floating means being adapted to be mounted pivotally at one end portion thereof, said vent opening being disposed outwardly from said one end portion at the opposite outer end portion thereof spaced outwardly from said inlet, said means defining at least one vent opening being free of any connections therewith.

4,000,527

SWIMMING POOL COVER FLOATING SUPPORT

Peter F. Gannon, Sterling Heights, Mich., assignor to Vinyl-Fab Industries, Inc., Ferndale, Mich.

Filed Aug. 26, 1975, Ser. No. 607,767
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172.12 6 Claims



1. A swimming pool cover support floating frame compris-

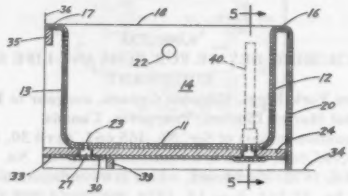
ing a plurality of separate elongated floating elements disposed below said cover and fastening means at each end of said elongated floating elements for pivotally and removably attaching juxtaposed ends of at least two of said elongated floating elements together and for attaching each free end of said elongated floating elements proximate the edge of the pool, some of said elongated floating elements extending from proximate the edge of the pool towards the center of said pool.

4,000,528

WHIRLPOOL TUB AND METHOD OF MAKING SAME

Irving H. Posnick, c/o Aqualand Pool Co., Inc. 3400 Dakota Ave. South, Minneapolis, Minn. 55416

Filed Mar. 10, 1975, Ser. No. 556,684
Int. Cl.² A61H *33/02*
U.S. Cl. 4—180 **11 Claims**



1. A whirlpool tub comprising:

A. an open topped synthetic resinous cavity shell having a bottom wall and side walls and adapted to contain liquid;

B. a rigid backing board adhesively affixed in air- and water-tight sealed relation to the bottom outside wall of said shell;

C. an elongated air distribution channel extending through the thickness of said backing board underlying said bottom wall;

D. an enclosing cover over the bottommost edges of said channel air- and water-tight sealed relation thereto;

E. a plurality of spaced apart apertures extending through the bottom wall of said shell and communicating with said channel; and

F. an air inlet in communication with said channel for transmission of air to said apertures.

6. A method of making a whirlpool tub from a formed open topped synthetic resinous cavity shell having a bottom wall and side walls, which method comprises:

A. applying a backup synthetic resinous reinforcing coating to the outer surface of said shell;

B. Adhesively adhering a rigid backing board in air- and water-tight sealed relation to the outside bottom wall of said tub, said backing board having an elongated air distribution channel extending through the thickness of said board;

C. applying an enclosing cover over the bottommost edges of said channel in air- and water-tight sealed relation thereto;

D. forming a plurality of apertures through the bottom wall of said shell and said resinous coating, said apertures communicating with said channel; and

E. affixing an air inlet in sealed relation in communication with said channel.

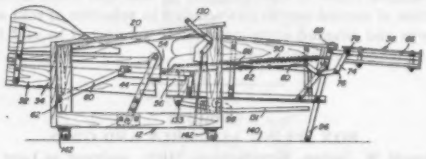
4,000,529

RECLINING CHAIR

Carmine De Maria, 39 E. Madison Ave., Collingswood, N.J. 08908

Filed Sept. 2, 1975, Ser. No. 609,737
Int. Cl.² A47C *17/14*
U.S. Cl. 5—37 R **7 Claims**

1. A seat construction including a main frame having front and rear portions, a first seat section, first means supporting said first section from said frame for shifting between a first rear position vertically registered with said main frame and a second forwardly displaced position with a majority of said first section projecting forwardly of said main frame, a second back rest section, second means pivotally supporting said second back rest portion from said frame and said first section and establishing a supportive link connection with said frame for automatic movement of said second section from a first raised upstanding position at the rear portion of said frame to a lowered second horizontal position disposed immediately to the rear of and in horizontal alignment with said first section and with a major portion of said second section disposed



forward of the rear portion of said frame movement of said first section to second second position thereof, and a third leg rest section, third means pivotally supporting said third section from said first section for automatice movement from a first position depending downwardly from the forward portion of said first section and a second horizontal position projecting forwardly from said first section upon movement of said first and second sections from the first positions thereof to said second positions thereof, said second means including swingable suspension link means operative to suspend substantially the entire load represented by the rear portion of said first section therefrom during movement of said first section between its first and second positions.

4,000,530

INVALID HANDLING DEVICE

Booker Green, 1600 Westmoreland Ave., Pittsburgh, Pa. 15206

Filed June 25, 1975, Ser. No. 590,383
Int. Cl.² A47B *83/04*; A61G *01/02*
U.S. Cl. 5—87 **7 Claims**

1. Invalid handling apparatus for lifting invalid patients from a bed and for transporting them from one place to another comprising an elongated frame unit, an elongated shaft rotatably supported in said frame unit and provided with a series of guide spools thereon, a pair of lifting belts for each of said guide spools with one end of each of said belts attached within each of said spools and the other ends thereof provided with connectors, motor drive means supported in said frame and including a reversible motor and gear reducer adapted to drive said shaft, downwardly disposed sockets quadrangularly positioned on the bottom of said frame unit, a carriage for supporting said frame unit for purposes of transport comprising four quadrangularly positioned legs with casters secured to their lower ends and their upper ends adapted to be received

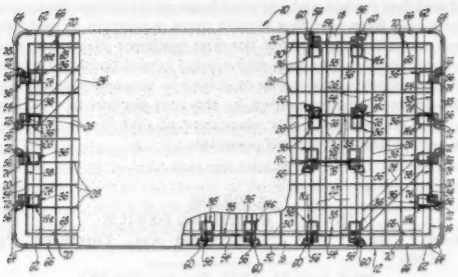
in said frame unit sockets, longitudinal bracing members secured between pairs of said carriage legs, hinge locking means in each of said legs between the upper ends thereof and the point of connection of said bracing members to said legs to permit said legs to swing inwardly of said frame unit, an elongated invalid carrier comprising a series of parallel and normally aligned strap members securely stitched at their points of crossing to provide a flexible mat for supporting an invalid, a series of loops formed in the ends of selective of said straps termination along each of the longest sides of said mat, said loops adapted to receive a ridged support bar along each of said longest sides of said mat an end support bar connected at its ends to one end of said support bars to form a three-piece U-shaped frame to effect rigidity to said mat when in use, a series of second connectors secured to selective of said strap loops and adapted to be detachably connected to said first-mentioned belt connectors.

4,000,531

BOX SPRING ASSEMBLY AND GRID

Harold W. Inman, Birmingham, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 17, 1976, Ser. No. 658,558
Int. Cl.² A47C *23/02*
U.S. Cl. 5—267 **12 Claims**



1. A box spring assembly comprising: a lower frame having lateral side members and longitudinal end members forming a rectangular configuration; a plurality of formed wire side springs mounted on the frame adjacent each lateral side member thereof; each of said side springs including a pair of fishmouth sections extending upwardly from the frame and a connecting section that interconnects the fishmouth sections above the frame; said connecting section of each spring having an inboard main portion and outboard end portions connected to opposite ends of the main portion; a grid of laterally and longitudinally extending wires that cross each other and are supported on the frame by said springs; said grid including lateral edges which each have a pair of longitudinally extending wires of a heavier gauge than the other wires of the grid; each heavier gauge wire being laterally spaced from the other adjacent heavier gauge wire so these wires assume inboard and outboard positions; and means securing one of the heavier gauge wires of each lateral grid edge to the connecting sections of the formed wire side springs mounted on the frame.

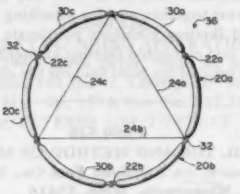
4,000,532

FENDING DEVICE FOR OIL CONTAINMENT BOOM

Erik C. Nielsen, R.D. 3 Box 360-K, Toms River, N.J. 08753

Filed Mar. 5, 1975, Ser. No. 555,366
Int. Cl.² B63B *35/00*; E02B *15/04*
U.S. Cl. 9—8 R **10 Claims**

1. A fending device for floating contaminent barriers comprising: an open planar structure; buoyant means associated with said structure to provide floatation thereof on water substantially coplanar to the surface of the water; and fender means extending transversely of the plane of said structure



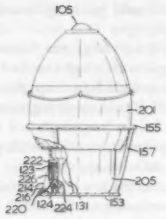
and extending above and below the waterline thereof to engage said barrier and block passage thereby.

4,000,533

ANCHORING DEVICE FOR BUOYANT LIFE SAVING EQUIPMENT

William York Higgs, Gibsons, Canada, assignor to Intercontinental Marine Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 465,661, April 30, 1974, Pat. No. 3,905,060, which is a continuation of Ser. No. 280,418, Aug. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,312, June 18, 1970, Pat. No. 3,703,736. This application Aug. 12, 1974, Ser. No. 496,711
Claims priority, application United Kingdom, Apr. 22, 1974, 17516/74
The portion of the term of this patent subsequent to Nov. 28, 1989, has been disclaimed.
Int. Cl.² B63C *9/22*
U.S. Cl. 9—9 **26 Claims**



1. In an anchoring device for buoyant equipment comprising a buoy suitable for being carried by a vessel in a manner permitting release and flotation of the buoy should the vessel sink, said buoy including sufficient buoyancy to cause the buoy and parts carried thereby to float free from the sinking vessel, a cable normally stowed in a manner allowing said cable to be pulled out to its full length, said cable being of adequate strength to act as an anchor cable, said cable being connected with the buoy and for connection with the vessel so as to maintain connection between the floating buoy and the vessel after the vessel has sunk: the improvement comprising a buoyant lifeboat mooring line of adequate strength to hold a life raft or boat in position relative to the buoy, said mooring line being permanently secured at one end to the buoy and being at least several times greater in length than the largest dimension of the buoy, said mooring line being normally stowed with the buoy in such manner as to be released automatically from the stowed position when the buoy separates from the vessel to permit said line to stream out in the water, whereby if the vessel sinks the buoy is released and remains on the surface of the water and said mooring line is released from said stowed position and streams out on the water to provide securement for buoyant equipment to hold this in position relative to the buoy.

4,000,534

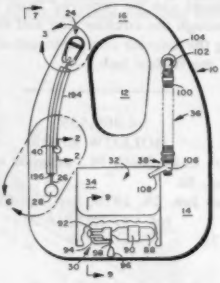
BUOYANCY COMPENSATOR

Leon A. Cerniway, Mission Viejo, and Donald W. Entrikin, Newport Beach, both of Calif., assignors to U. S. Divers Company, Santa Ana, Calif.

Continuation of Ser. No. 427,545, Dec. 26, 1973, abandoned. This application June 13, 1975, Ser. No. 586,616

Int. Cl.[2] B63C 9/18

U.S. Cl. 9—342 10 Claims



1. A buoyancy compensator for providing a diver with buoyancy gas comprising:

a vest having a collar and an opening through which a user's head can pass made of an outer textile material which has a limited degree of stretchability with a substantially freely implaced plastic inner bladder having a communicating void therein which conforms to the outer material substantially throughout the entirety of the outer material and is controlled in its expansion to the limits of the outer material expansion;

straps attached to the vest for maintaining the vest on a user's body;

an oral filling means comprising a flexible tube connected to the interior of said vest at one end of said tube, with an oral inflation valve assembly at the other end of said tube having a mouthpiece connected to a valve housing, with a spring biased hand operated valve member for sealing against the interior of said housing to prevent the escape of gas therethrough connected to an operating member at least partially exposed extrinsically to said housing, so that when said valve member is moved from the valve housing by said operating member, it will permit oral inflation of said vest; and,

a relief valve connected to the vest for release of pressure within the cavity of said vest.

4,000,535

SHOE MACHINE SHOE SIZE AND SIDE SENSING ARRANGEMENTS

George Clifford Barton, deceased, late of Leicester, England (by Margaret Ellen Barton, executrix), assignor to USM Corporation, Boston, Mass.

Filed June 5, 1975, Ser. No. 583,951

Claims priority, application United Kingdom, June 5, 1974, 24866/74

Int. Cl.[2] A43D 3/00, 23/00

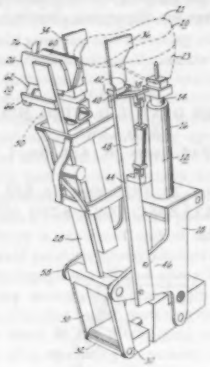
U.S. Cl. 12—126 5 Claims

1. A machine for lasting shoes, including:

a shoe assembly supporting arrangement;

a last engaging member for supporting a heel end portion to a last;

a shoe assembly aligning arrangement comprising at least two gauges, one on each side of said shoe, said gauges being movable toward and away from the sides of said shoe assembly comprising means for moving said shoe assembly upon a signal from a movable sensor; and means for moving said shoe assembly alignment arrangement in a sequential manner;



said movable sensor comprising a pivotal finger member connected with a control circuit movable about an axis on an actuating member, said pivotal member having means for activating a circuit control switch.

4,000,536

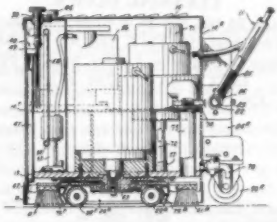
FLOOR CLEANING MACHINE WITH FOAM DISPENSING SYSTEM

James E. Nayfa, 5015 Sharp St., Dallas, Tex. 75247, and Andrew D. Stanley, 2306 Cedar Way Drive, Dallas, Tex. 75241

Division of Ser. No. 390,023, Aug. 20, 1973, Pat. No. 3,931,662, which is a division of Ser. No. 147,866, May 28, 1971, Pat. No. 3,761,987. This application Jan. 8, 1976, Ser. No. 647,503

Int. Cl.[2] A47L 11/284, 11/30, 11/34

U.S. Cl. 15—50 A 8 Claims



1. A machine for treating floor surfaces comprising

a housing having front and rear ends in relation to normal movement over a floor surface in one direction;

means mounted on said housing for supporting said housing for movement along the floor surface;

supply means in said housing for supplying a cleaning foam; brush means mounted under said housing; power means in said housing for producing movement of said brush means in the floor plane, relative to said housing;

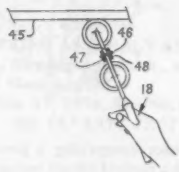
said cleaning foam supply means including; a supply tank in said housing having a main chamber for containing a liquid solution, means in said main chamber for producing a foam of the solution therein, including a source of compressed air communicating with said tank main chamber for pressurizing said tank and for aerating said solution to produce said foam, elongated transverse

trough means in said tank defining a dispensing chamber, adjustable gate means for regulating the flow of solution foam from said supply tank main chamber into said dispensing chamber and dispensing means disposed at the front end of said housing communicating with said dispensing chamber for dispensing cleaning foam onto said floor surface.

4,000,537
PAINT ROLLER DEVICE HAVING JUXTA-POSED ROLLERS

Yen Kong Woo, 1545 Geary St. Apt. No. 1, San Francisco, Calif. 94115

Filed Oct. 23, 1975, Ser. No. 625,310
Int. Cl.² B05C *17/02*; B25G *1/04*
U.S. Cl. 15—230.11 4 Claims

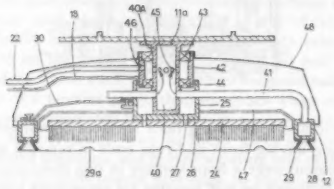


1. A drip proof paint roller device comprising a planar axle frame comprising a pair of juxta-posed roller axles arranged in parallel relation, a lead paint roller mounted for rotation on one of said pair of juxta-posed roller axles, a follower roller mounted for rotation on the other of said pair of juxta-posed axles, an actuating handle pivotally mounted on said axle frame for moving both said lead roller and said follower roller in simultaneous rolling engagement with a paint receiving surface, (as well as) and means engaging the frame and handle for locking said handle only in the plane of said axle frame for moving said lead roller about an overhead surface while simultaneously maintaining said follower roller in a drip-catching relation to said lead roller away from said overhead surface.

4,000,538
CLEANING DEVICE

Jacques Tissier, 26 bis, rue de la Gaite, 94 Villejuif, France

Filed Mar. 10, 1975, Ser. No. 556,960
Claims priority, application France, Mar. 8, 1974, 74.07898
Int. Cl.² A47L *11/30*, *11/293*
U.S. Cl. 15—320 13 Claims



1. A cleaning device for cleaning a floor or other surface, said device including a cleaning disc having a vertical axis of rotation, a reservoir feeding cleaning liquid to the disc and means to control the flow of cleaning liquid. the improvement which comprises:

A. a rotatable hollow hub concentric with the axis of rotation of the cleaning disc and mounting said disc;

B. a circular ring having an interior compartment and a passageway communicating the interior compartment with the surface to be cleaned, said ring surrounding the cleaning disc for defining the area to be cleaned and including downwardly directed flexible skirts forming said passageway;

C. floatable mounting means connecting the cleaning disc to the circular ring for permitting floating movement of the ring relative to the disc, whereby the flexible skirts can be maintained in contact with the surface being cleaned under all conditions of use;

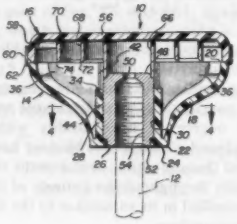
D. a flexible conduit interconnecting the interior compartment of the circular ring with the interior of the hollow hub; and

E. suction means applies to the hollow hub, whereby dirty cleaning liquid can be removed from the surface being cleaned through the circular ring and the flexible conduit connecting the interior compartment of the ring with the interior of the hollow hub.

4,000,539
HOLLOW KNOB

James U. Neyer, Lake Bluff, Ill., assignor to Arens Controls, Inc., Evanston, Ill.

Filed Jan. 29, 1976, Ser. No. 653,358
Int. Cl.² E05B *1/00*
U.S. Cl. 16—121 8 Claims



1. A hollow plastic knob comprising a lower portion having a downwardly opening recess therein, a metallic insert in said recess for receiving a member to be moved by said knob, said lower portion having retaining means adjacent said recess for trapping said insert in said recess, and a top portion secured to said bottom portion and having a part thereof bearing against said insert adjacent the upper end to hold said insert against said retaining means and for bracing said upper portion, said portions having relatively transverse ribs. reinforcing the respective portions and having cross-overs at which said ribs are secured to one another.

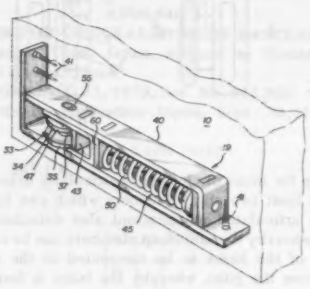
4,000,540
SPRING LOADED, ADJUSTABLE WALKING DOOR HINGE

Robert L. Newlon, Sterling, Ill., assignor to Lawrence Brothers Inc., Sterling, Ill.

Filed Apr. 19, 1976, Ser. No. 678,139
Int. Cl.² E05D *7/08*
U.S. Cl. 16—151 29 Claims

1. Door pivot mechanism for use with a door structure sized to fit within a space defined by a fixed floor and frame structure, the door structure having a vertical edge in relatively juxtaposed relation to a vertical portion of the fixed frame structure when the door structure is in a closed position and in a relatively spaced apart relation to the frame vertical portion when the door structure is in an open position, said door pivot mechanism including first and second units mounted at top and bottom inner door structure corners and adjacent frame and floor structure, the first unit comprising a pintle, means for affixing the pintle to one of the structures in nonmoving relationship, a cam affixed to the pintle in nonmoving relationship therewith, the cam being at least partially defined by a curved cam surface generated by a genetrix which moves radially outwardly from the pintle as a directrix moves angu-

larly away from the door structure closed position, a cam follower carried by the other structure, positive force biasing means urging the cam follower into abuttive contact with the cam such that upon opening movement, relative movement is produced between said cam and said cam follower, for increasing the positive force of the biasing means to urge the door structure toward its closed position throughout a range of door structure partially opened positions and also to space said door structure from the frame, and the second unit comprising a pintle, means for affixing the pintle to one of the structures in nonmoving relationship, a cam affixed to the pintle in non-moving relationship, the cam including a plural-



ity of lobes, and a cam follower affixed to the other structure in nonmoving relationship, the cam and cam follower having mutually engaging surfaces such that movement of the door structure from the fully closed position through its partially opened positions produces radially outward motion of the cam and pintle and relative to the cam follower and corresponding motion of the door structure relative to the frame and floor structure, the first and second units thus causing the door structure vertical edge to displace from the relatively juxtaposed position adjacent the frame structure vertical portion when the door is in its closed position to it relatively spaced apart position relative to the frame structure vertical portion when the door is in its open position.

4,000,541

INSTALLATION FOR METERING TEXTILE FIBERS

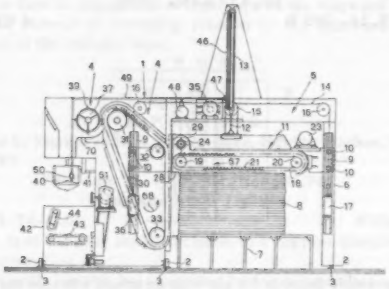
Angelo Marzoli, Bergamo, Italy, assignor to F. Lli Marzoli & C. S.p.A., Bergamo, Italy

Filed Apr. 4, 1975, Ser. No. 565,252

Claims priority, application Italy, Apr. 10, 1974, 21222/74

Int. Cl.² D01G *7/00*

U.S. Cl. 19—81 **7 Claims**



1. An arrangement for feeding metered amounts of textile fibers, comprising at least one machine for grasping and metering the fibers, a guideway including support means for longitudinally spaced bales of fibers, driving means for moving said grasping and metering machine step by step along said guideway to successively position it over different bales of fibers and at least one discharging and dispensing machine arranged in a predetermind position along the guideway so as to be operatively engaged by the grasping and metering machine at the end of an operating movement of the latter along the guideway, said grasping and metering comprising a bridge-like portion transversally arranged over the guideway so as to be successively superimposed to the spaced bales, a rotary spiked apron horizontally arranged and vertically displaceable in said bridge portion so as to engage the top of a bale below to grasp and horizontally displace the upper fibers thereof, conveying means arranged to receive the fibers displaced by the spiked apron and to convey them towards a metering device, means to actuate said metering device to dump the metered fibers into a container when a predetermined amount of conveyed fibers is metered, spiked apron lifting means operable when said predetermined amount of conveyed fibers is metered to disengage the spiked apron from the bale and further conveying means associated with the container to receive the fiber dumped by the metering device and to subsequently transfer them to the discharging and dispensing machine at the end of an operating movement of the grasping and metering machine along the guideway.

4,000,542

DEVICE FOR ADJUSTING THE LENGTH OF A WATCHBAND

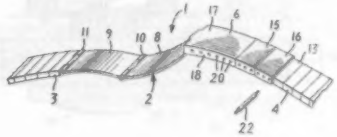
Tokio Omichi, Tokyo, Japan, assignor to Kabushiki Kaisha Bambi and Kabushiki Kaisha Hattori, both of, Japan

Filed Mar. 21, 1975, Ser. No. 560,701

Claims priority, application Japan, Apr. 4, 1974, 49-37796[U]

Int. Cl.² A43C *11/00*; A44B *21/00*

U.S. Cl. 24—71 J **4 Claims**



1. A device for adjusting the length of a watchband comprising, a three-element fitting connectable intermediate two opposite ends of a watchband comprising a main link on one end of said fitting longer than other links of a watchband to which said three-element fitting is attached and two-foldable elements foldable over one another and positionable underlying the main link to jointly therewith define a closure for the watchband, means pivotally connecting the two-foldable elements, means for pivotally connecting an end one of said two-foldable elements to an end of a watchband, means for pivotally connecting the other of the two-foldable elements to said main link, said main link having a top the length of the main link and two parallel sidewalls opposite one another extending along the side of said top, said sidewalls having two opposed openings for receiving a spring-loaded pin from the underside of said main link, at least one length-adjusting link shorter in length than said main link, said length-adjusting link having a top of equal width to the top of said main link and two opposed sidewalls similar in configuration to the walls of said main link and having axially spaced openings for receiving a spring-loaded pin extending between the two sidewalls on an underside of said top, a spring-loaded pin positionable in use extending between said two sidewalls underneath said top, said end of said watchband to which said length-adjusting link is connected in use comprising an end link having an end loop through which said spring-loaded pin extends and is received in opposed openings on said sidewalls releasably linking said end link and said length-adjusting link, said length-adjusting

link having a connection extension extending offset from said top for underlying said top of said main link when in assembled state therewith, said extension having two laterally spaced loops positionable in alignment with opposed openings in the sidewalls of said main link, a second spring-loaded pin for extending through the last-mentioned loops and releasably received in use in said last-mentioned opposed openings thereby for releasably connecting said main link and said length-adjusting link, said extension having a tongue extending forwardly of said loops for underlying said main link and disposed in said assembled state between the underside of the top of said main link and said second spring-loaded pin to preclude relative pivotal movement therebetween, and said offset being dimensioned so that said top of said main link overlies said extension and the top of said main link and said top of said length-adjusting link are flush in said assembled state, whereby in said assembled state said sidewalls of said length-adjusting link and said main link are aligned and abutting and said length adjusting link is a rigid extension of said main link.

4,000,543

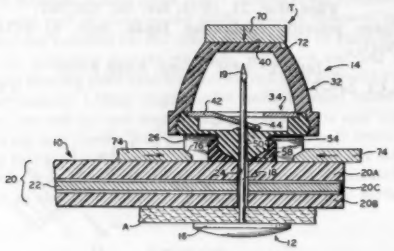
MONITOR ACTUATING DEVICE AND REUSABLE FASTENER THEREFOR

Joseph H. Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 2, 1975, Ser. No. 636,867

Int. Cl.[2] A44B *9/00*

U.S. Cl. 24—150 R **27 Claims**



1. A reusable fastener for attachment to the end of a shaft, said fastener comprising:

a generally hollow body having an upper generally dome shaped portion and a lower portion, said lower portion defining a bore opening to the bottom surface of said lower portion for receipt of the shaft, said lower portion including a generally tubular member at least partially defining the bore adjacent the opening thereto axially movable relative to the dome shaped portion, said tubular member having an outer cam surface tapered radially inwardly and towards the opening to the bore, radially inwardly directed force on said cam surface being effective to move said member towards said dome shaped portion; and

a resilient one-piece spring steel clip mounted within said body, said clip having a base axially fixed and freely rotatable relative to said dome shaped portion, said base being generally annular in cross-section and the axis of rotation of the base being substantially coaxial with the axis of the bore, said clip having an aperture therethrough sized to receive said shaft, said clip having a first non-deformed position in which said aperture will not register with said bore and a second resiliently deformed position in which said aperture will substantially register with said bore, said axially movable tubular member being engageable with said clip to urge said clip towards said second position when said tubular member is moved axially towards said dome shaped portion.

4,000,544

CLASP

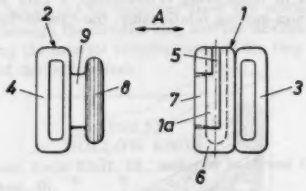
Gerhard Fildan, 31 Kriehubergasse, A-1050 Vienna, Austria

Filed Sept. 16, 1975, Ser. No. 614,029

Claims priority, application Austria, Sept. 19, 1974, 7533/74; Jan. 13, 1975, 197/75; Feb. 6, 1975, 918/75; May 26, 1975, 3988/75; Aug. 14, 1975, 6349/75

Int. Cl.[2] A44B *11/25, 17/00*

U.S. Cl. 24—201 CF **10 Claims**



1. Clasp for items of clothing, particularly brassieres, comprising at least two clasp members which can be joined together in articulated manner and also detached from one another, whereby the said clasp members can be connected to the ends of the items to be connected at the end thereof remote from the joint, whereby the latter is formed from a longitudinally slotted member having a cylindrical bore disposed on one of said clasp members at right angles to the connecting line between said clasp members and by a roll insertable in the said cylindrical bore, said roll connected to the other of said clasp members by a web, wherein the slot is arranged in a plane at an angle of 60° to 90° to the clasp plane, so that the two joint portions are inserted into one another in an angular position and are brought into an extended position corresponding to the clasp position by swivelling, whereby in the area of said slot is provided a space laterally communicating with said slot for receiving the web on swivelling the clasp portions from the angular position into the extended position, said one clasp portion including a protrusion acting in a snap fastener like manner and disposed in the path of the other clasp portion on reciprocal rotation of the two portions with respect to each other.

4,000,545

SLIDE FASTENER WITH EMERGENCY OPENING MEANS

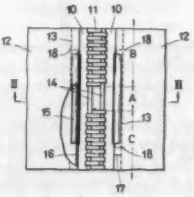
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Oct. 16, 1975, Ser. No. 623,262

Claims priority, application Japan, Oct. 22, 1974, 49-121742

Int. Cl.[2] A44G *19/00*

U.S. Cl. 24—205 R **4 Claims**



1. In a slide fastener for use with an article wherein the slide fastener includes a pair of stringer tapes which carry interlockable rows of scoops along their opposed longitudinal edges and which are attached to the edges of the article bounding an opening therein, the combination thereof with an emergency opening zone which is located intermediate both ends of said

rows of scoops and in which said rows of scoops are incapable of interlocking engagement when the slide fastener is closed, said tapes extending throughout said emergency opening zone to accommodate disengagement of said rows of scoops by forces applied to the tapes in said emergency opening zone, and a pair of reinforcements of relatively rigid material fixedly arranged along and on the opposite sides of said emergency opening zone and spaced from said longitudinal edges, each reinforcement being longer than said emergency opening zone and extending substantially beyond both extremities thereof and in longitudinally overlapping relation with interlockable scoops of said rows.

4,000,546

SLIDER FOR CONCEALED SLIDE FASTENERS

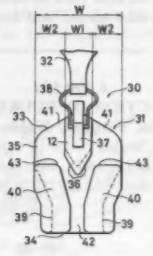
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 23, 1975, Ser. No. 615,844

Claims priority, application Japan, Sept. 30, 1974, 49-118759[U]

Int. Cl.² A44B *19/32*

U.S. Cl. 24—205.1 R **2 Claims**



1. In a concealed slide fastener of the type wherein a pair of stringer tapes have rearward folds formed along their confronting longitudinal edges to support respective rows of scoops thereon, a slider movable along said rows of scoops for coupling and uncoupling the same, said slider comprising, in combination: a rear wall having a separator formed centrally at its upper end, said separator having a pair of inner lips formed at its inboard end and a pull tab pivotally coupled thereto; a pair of side walls extending along the respective marginal edges of said rear wall from its lower end and terminating short of its upper end; and a pair of outer lips extending toward each other from said side walls, respectively, and having upper ends arranged slightly upwardly of the inboard end of said separator, said upper end of each outer lip having an inside corner opposed to one of said inner lips and spaced therefrom a distance slightly in excess of the thickness of each stringer tape to engage the stringer tape at the rearward folding line thereof in overlying relation to the rearward fold portion of the stringer tape.

4,000,547

SNAP FASTENER

Marvin L. Eisenpresser, 4 Willow Lane, Hewlett Harbor, N.Y. 11557

Filed July 25, 1975, Ser. No. 598,741

Int. Cl.² A44B *17/00*

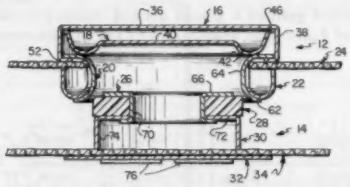
U.S. Cl. 24—214 **9 Claims**

1. A snap fastener stud attachable to a support comprising the combination of:

a generally circular base member having a central opening;

a continuous annular resilient washer having a central opening substantially aligned with said central opening of said base member and having an outer diameter larger than the outer diameter of said base member, one face of said resilient washer being adjacent said base member;

an eyelet having a substantially flat annular portion adjacent the other face of said resilient washer, and a tubular portion extending through said central openings in said resilient washer and said base member,



said tubular portion having an enlarged portion at the distal edge thereof for engaging said base member,

said annular portion having an outer diameter smaller than the outer diameter of said resilient washer; and

means for connecting said stud to a support.

4,000,548

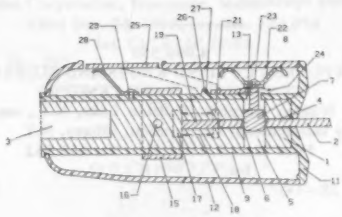
SEPARABLE FASTENER WITH PIN LATCH

Robert L. Stephenson, Sterling Heights, and Jerome W. Schotthoefer, New Baltimore, both of Mich., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 4, 1976, Ser. No. 663,943

Int. Cl.² A44B *11/26*

U.S. Cl. 24—230 AL **18 Claims**



1. A seat buckle and tongue in combination comprising:

a ferrule having a passenger restraint fixed to one end, a through slot at the other for engaging the tongue, and an opening extending at least into the slot from the surface of the ferrule above the slot; a pin, positioned for motion within the opening and biased for engaging an opening in the tongue when said tongue is inserted into the slot; means for raising the pin in opposition to its bias to a position above the slot; and a tongue ejection member having a flat portion for longitudinal sliding action within the slot, said tongue ejection member being biased outwardly to the point in the slot directly beneath the pin.

4,000,549

STABILIZER

Ralph E. Brumley; Mathew B. Riordan, and Richard H. Bentley, all of Houston, Tex., assignors to Eastman-Whipstock, Inc., Houston, Tex.

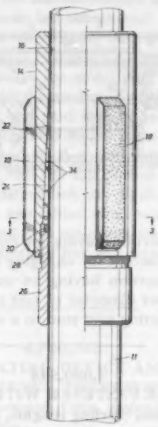
Filed July 14, 1975, Ser. No. 595,891

Int. Cl.² F16C *1/26, 29/00*

U.S. Cl. 24—263 KS **2 Claims**

1. A stabilizer for mounting on a drill string for limiting the lateral movement of the drill string during drilling operations comprising a tubular body for positioning on the drill string in the desired location and having a bore with a locking taper that increases in diameter toward one end thereof at an angle of about 3°, a plurality of spaced parallel slip fingers for posi-

tioning between the tapered bore and the drill string and parallel to the longitudinal axis of the bore, each finger having a tapered outer surface to engage the tapered bore of the body, means for holding the fingers in said parallel relationship, and means for forcing the fingers longitudinally of the



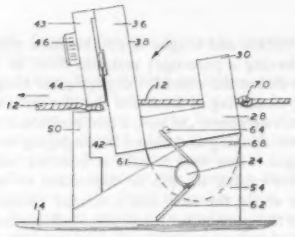
body to cause the tapered outer surface of the fingers to move along the tapered bore and be forced inwardly into frictional engagement with the drill string sufficiently to hold the body from movement longitudinally in either direction from the desired position on the drill string while the drill string is used in a drilling operation.

4,000,550

APPARATUS FOR CUTTING KNOTS AND SLUBS OUT OF CONTINUOUS YARN LENGTHS

Richard William Karpluk, Ballston Lake, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,962
Int. Cl.² D01H *13/32*
U.S. Cl. 28—(• **3 Claims**



1. An apparatus for severing a continuous length of yarn or monofilament containing knots, kinks, or slubs, to prevent take-up of said knots, kinks or slubs into yarn and monofilament processing machinery, which comprises:

a. a base support;

b. a pivot axle support attached to said base support;

c. a stationary pivot axle supported by said axle support;

d. a pivot block mounted on said axle so as to pivot freely between a first and second position, said block having a lead end and a trail end;

e. first stop means;

f. an open, straight, yarn traveling path through said block, between said lead end and said trail end, the entry to said path being of a dimension permitting the passage of said yarn and monofilament but denying passage of knots, kinks and slubs in said yarns and monofilaments;

g. spring means for yieldingly urging said block in said first position against said first stop means when yarn and monofilament lengths entering the entry to said path are free of knots, kinks and slubs, said spring means being overcomeable by a predetermined pressure on said lead end, said spring means being supported by said base support;

h. blade holder means attached to said pivot block;

i. blade means supported by said blade holder means and disposed adjacent said path when said block is in said first position, said blade means being moveable with said pivot block to enter said path and sever a yarn or monofilament disposed therein upon transfer of said block from said first position to said second position;

j. second stop means against which said blade holder abuts in said second position, said second stop means and said blade holder cooperating in abutment to hold said yarn or monofilament as it is severed by said blade means upon a knot, kink or slub in said yarn or monofilament being denied entry to said path and causing pressure to overcome said spring means to transfer said block from said first position to said second position;

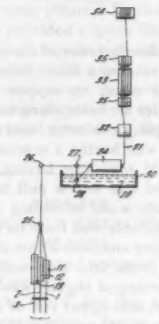
k. and said spring means returning said block to said first position upon release of pressure of the knot, kink or slub upon severance of said yarn or monofilament intermediate said second stop means and the entry of said path.

4,000,551

PRODUCTION OF BULKY YARNS

Gordon Alan Holden, Bargoed, Wales, assignor to Crimpfil Limited, Bargoed, Wales

Filed Jan. 15, 1975, Ser. No. 541,355
Int. Cl.² D02G *1/16*
U.S. Cl. 28—72.12 **7 Claims**



1. A method of producing bulky, continuous filament yarn in which primary continuous multi-filament yarns of polymeric material comprising at least 20% of the total filaments are substantially straight and free from crunodal ring-like loops and secondary continuous multi-filament yarns of polymeric material comprising up to 80% of the total filaments are formed at randomly spaced longitudinal intervals with crunodal ring-like loops separated by relatively straight portions and are intermingled with each other and with the substantially straight filaments of the primary yarns so that, when a gradually increasing tensile load is imposed on the bulky yarn, the filaments of both the primary and secondary yarns break simultaneously; the method including the steps of:

pre-treating at least one of the primary and secondary continuous multi-filament yarns by the application of water;

feeding the primary and secondary yarns into a treatment zone so that at least one of the primary and secondary yarns is fed into the treatment zone along a path which is colinearly aligned with a rectilinear path along which the yarn passes through the treatment zone and so that each

yarn to which water has been applied enters the treatment zone while still wet;

providing within the treatment zone a fluid flow of sufficient turbulence to separate the individual filaments of the yarns, to form crunodal ring-like loops and other convolutions at randomly spaced intervals along the lengths of the individual filaments of each secondary yarn, and to cause the individual filaments of each secondary yarn to intermingle with each other and with the individual filaments of each primary yarn to form a single bulky yarn;

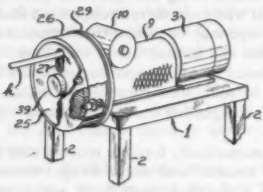
withdrawing the intermingled filaments from the treatment zone at a rate such that each primary yarn is fed into the treatment zone at a rate between 4% and 26% higher than the rate at which the intermingled filaments are withdrawn from the treatment zone and each secondary yarn is fed in to the treatment zone at a rate which is at least 2.5% higher than the rate of feed of each primary yarn and up to 30% higher than the rate at which the intermingled filaments are withdrawn from the treatment zone.

4,000,552

HYDRAULIC HOSE SKIVING MACHINE

Duane R. Pleis, Brandon, S. Dak., assignor to Dakota Iron, Inc., Sioux Falls, S. Dak.

Filed Nov. 10, 1975, Ser. No. 630,169
Int. Cl.² B23D *67/00*
U.S. Cl. 29—76 R **6 Claims**



1. A hydraulic hose skiving machine for preparing hose to receive couplings, comprising:

a frame ,

a high speed rotary motor driven skiving tool mounted on the frame for rotation about a fixed axis,

a mandrel support rotatable about the skiving tool,

a mandrel secured to said support and cantilevered past said skiving tool for receiving a hose end telescoped thereover, said mandrel carried in predetermined desired spacing from said tool,

and power means for turning said support to carry the mandrel about the periphery of said skiving tool for removing a desired thickness layer of material from a hose end on the mandrel.

4,000,553

ROLLER OR ROLL ASSEMBLY

Ronald Spannlang, Linz, and Franz Kagerhuber, Traun, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

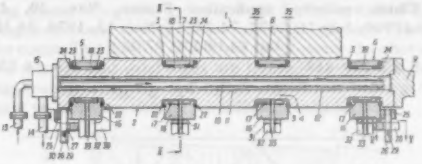
Filed Oct. 20, 1975, Ser. No. 624,064
Claims priority, application Austria, Oct. 22, 1974, 8480/74
Int. Cl.² B21B *13/02*
U.S. Cl. 29—115 **8 Claims**

1. A roller or roll assembly for supporting, guiding, bending, straightening or deforming a continuously cast strand of relatively great width, in particular a steel slab of a width exceeding 1,000 mm, in a continuous casting plant having a supporting construction, which roller or roll comprises annular recesses distributed over its longitudinal extension to form bearing pins of a substantially cylindrical shape, which assembly further comprises

an outer fixed bearing having a bearing housing and accommodating one of said bearing pins, which outer fixed bearing is supported on the supporting construction,

an abutment secured to the supporting construction and axially holding the bearing housing of said outer fixed bearing,

an outer expansion bearing having a bearing housing and accommodating one of said bearing pins, which bearing is



supported on the supporting construction and arranged for axial displacement thereon and held perpendicularly to the direction of displacement,

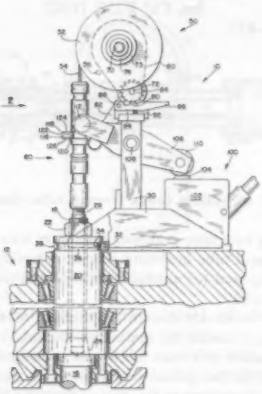
at least one inner expansion bearing having a bearing housing and accommodating one of said bearing pins, which at least one inner expansion bearing is arranged between said outer fixed bearing and said outer expansion bearing and rests loosely on said supporting construction.

4,000,554

SCREW REMOVING APPARATUS FOR VERTICAL EXTRUDERS

Alden W. Nelson, West Mystic, Conn., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Dec. 22, 1975, Ser. No. 643,070
Int. Cl.² B23P *19/06*
U.S. Cl. 29—252 **8 Claims**



1. Screw removing apparatus for removing a screw from the barrel of a vertical extruder in which the screw is removable through the bottom of said barrel, said apparatus comprising:

a. an adaptor for fastening to the upper end of said screw and which contains at least one surface which is horizontal when said adaptor is fastened to said screw from which a downward force may be transmitted through said adaptor to said screw;

b. a winch adapted for fastening to said adaptor and which includes yieldable locking means for enabling said winch to support the weight of said screw and which is yieldable for allowing downward movement of said screw upon application of a predetermined downward force against said horizontal surface; and

c. power means adapted for engaging said horizontal sur-

face for transmission of a downward force which is sufficient to overcome said yeildable locking means and cause downward movement of said screw.

4,000,555

PROCESS FOR PRODUCING STRAW-BOTTOMED CHAIRS

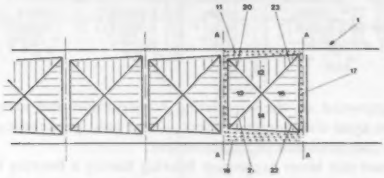
Pierre Bruniaux, 8, rue des Bouchers, Cambrai (Nord), France

Filed Nov. 26, 1974, Ser. No. 527,511

Claims priority, application France, Nov. 30, 1973, 73.42900; July 16, 1974, 74.24751; Nov. 13, 1974, 74.37452

Int. Cl.² B23P *17/04*

U.S. Cl. 29—417 **6 Claims**



1. A process for producing straw-bottomed chairs comprising the steps of weaving a piece of fabric from a straw-like material, simultaneously securing said straw-like material with threads of a non-straw-like material and then securing and tensioning said woven straw-like material secured by said non-straw-like material onto a support means to form the seat of a chair.

4,000,556

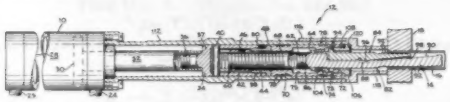
METHOD AND APPARATUS FOR PULLING TUBES

Anthony S. Ciminero, 115-½ Chenery St., San Francisco, Calif. 94131

Filed Nov. 17, 1975, Ser. No. 632,317

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **9 Claims**



1. Method of pulling tubes from a tube sheet, comprising the steps of:

a. inserting two tube grabbing members into the tube being pulled, said tube grabbing members having a plurality of teeth disposed for engagement with the interior side wall of said tube;

b. rotating relatively one tube grabbing member about the lonitudinal axis of the apparatus to cause relative longitudinal motion between both said members and to cause variation in the lateral dimension between the members so that adjustment to the size of the tube being pulled can be effected;

c. translating the tube grabbing members relatively and longitudinally by withdrawing slightly one tube grabbing member from the tube while maintaining the other grabbing member stationary, said tube grabbing members being mated to form a wedge so that said relative translational motion provides lateral dimensional variation that causes the tube grabbing members to engage the interior side wall of the tube;

d. compensating for misalignment between the tube grabbing members and the side wall of the tube during the step of relative translation;

e. translating both tube grabbing members together and thereby extracting the tube from the tube sheet; and

f. releasing the tube grabbing members from engagement with the interior side wall of the tube by relatively translating in a longitudinal direction one of said tube grabbing members with respect to the other.

4,000,557

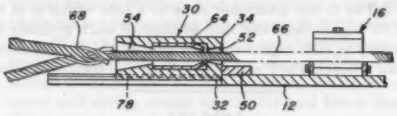
METHOD AND APPARATUS FOR SECURING SWAGE SLEEVES UPON A WIRE ROPE SPLICE

Orval C. Bawden, Orem, and Leonard F. Harris, Provo, both of Utah, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1975, Ser. No. 630,385

Int. Cl.² B23P *19/02*

U.S. Cl. 29—525 **9 Claims**



1. Apparatus for securing swage sleeves upon a wire rope having a splice thereon configured to form a sling at the end of such wire rope, said apparatus comprising:

a supporting structure;

means movably mounted on said supporting structure for securing and capturing a swage sleeve, said securing and capturing means being configured to permit the passage of an end of wire rope therethrough such that such end of such wire rope may be passed through such swage sleeve to be spliced and formed into a sling loop;

means positioned on said supporting structure for clamping a portion of such wire rope on the other side of said securing and capturing means from such wire rope sling loop; and

means for automatically forcibly moving said securing and capturing means, and such swage sleeve contained therein, in a direction away from said clamping means and toward such sling loop on such end of the wire rope for forcing the spliced portion into such swage sleeve such that a stronger splice is realized when such swage sleeve is swaged.

9. A method of automatically securing swage sleeves on wire rope sling splices, said method comprising:

fitting a swage sleeve within a holder complementarily configured relative to the swage sleeve;

threading the end of a wire rope, intended to be spliced into a sling, into the holder and through the swage sleeve contained therein;

forming the wire rope end into a spliced sling;

clamping the wire rope at a point on the opposite side of the holder from the spliced sling;

automatically moving the holder, and the swage sleeve contained therein, in a direction away from the point at which the wire rope is clamped and toward the splice formed on the sling, thereby forcing the swage sleeve onto the splice of the wire rope; and

releasing the swage sleeve from the holder and unclamping the wire rope in preparation for a swaging operation.

4,000,558

PROCESS OF FABRICATING WIRING HARNESS

Robert Francis Cahill, Westport, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 189,174, Oct. 14, 1971, abandoned. This application June 12, 1973, Ser. No. 369,322

Int. Cl.² B41M *3/08*

U.S. Cl. 29—625 **5 Claims**

1. A method of forming flexible wiring harnesses comprising placing an adhesive coated first flexible plastic sheet, adhesive side up, in contact with a positioning jig and a platen,

applying a vacuum through hold-down tubes to temporarily maintain said flexible plastic sheet in contact with the positioning jig and platen,

unreeling a conductive wire from a spool under control of an actuator,

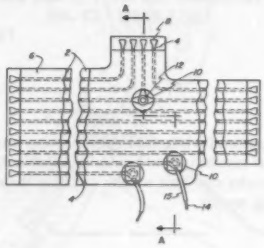
feeding said wire under control of a controller to a cut-off actuator,

cutting said wire after a prescribed length of wire has passed said cut-off actuator,

feeding said wire under controls of the controller between a flattening actuator and an anvil,

flattening said wire on said anvil at prescribed places,

feeding said wire under a press-down wheel onto the adhesive coated plastic sheet,



positioning the press-down wheel, under control of the controller, to guide said wire and to press it down continuously in a chosen pattern onto the adhesive coated plastic sheet,

moving the platen relative to X and Y axes in accordance with a pre-determined program to locate the conductive wire on the first plastic sheet in accordance with the desired pattern,

placing a second flexible plastic sheet over the adhesive surface to cover the wire and the first flexible plastic sheet,

feeding the second flexible plastic sheet, the wire and first flexible plastic sheet under a roller, and

pressing the second flexible plastic sheet into position under the roller and against the wire and the first flexible sheet to form a flexible wiring harness.

4,000,559

COMBINED BEARING

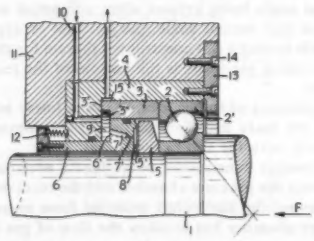
Heinz Korrenn, Obbach, and Horst Voll, Hassfurt, both of Germany, assignors to Kugelfischer Georg Schafer & Co., Germany

Filed Oct. 8, 1975, Ser. No. 620,765

Claims priority, application Germany, Oct. 12, 1974, 2448785

Int. Cl.² F16C *32/00*

U.S. Cl. 308—35 **8 Claims**



1. In a combination bearing including a rolling bearing assembly mounted in a housing and capable of transmitting axial loads to the housing through an axially displaceable outer ring and an hydrostatic thrust bearing mounted in the housing in tandem with the rolling bearing assembly and having an axially displaceable piston forming, with a wall of the housing, an oil pressure chamber capable of receiving a constant quantity of externally produced oil supplied under pressure to the hydrostatic thrust bearing, the improvement comprising hydrostatic control bearing means positioned in the housing in abutment with the outer ring of the rolling bearing assembly and the wall of the housing, said hydrostatic control bearing means being axially displaceable from the wall of the housing in response to oil pressure within the pressure chamber for controlling flow-off of oil from the pressure chamber in such a manner that axial loads are transmitted through the rolling bearing assembly and hydrostatic thrust bearing in constant proportions, despite variations in axial loading.

4,000,560

ELECTRIC SHAVER

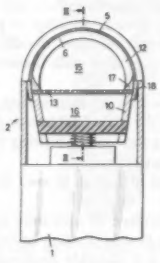
Gert Gutjahr, Neckarhauserstrasse 61, 6800 Mannheim, New Edingen, Germany

Filed Feb. 19, 1976, Ser. No. 659,468

Claims priority, application Germany, Apr. 24, 1975, 2518140

Int. Cl.² B26B *19/38*

U.S. Cl. 30—41.6 **6 Claims**



1. An electric shaver comprising:

a. body member;

b. a head member including a guard of sheet material formed with perforations therethrough;

c. securing means for releasably securing said members to each other in a position in which the secured members jointly define a cavity;

d. a partition in said cavity dividing the cavity into a first compartment adjacent said guard and directly communicating with said perforations and a second compartment remote from said perforations, said partition being formed with a multiplicity of apertures connecting said compartments;

e. blade means mounted in said first compartment on one of said members and engaging said guard; and

f. electrically operated drive means in said body member connected to said blade means and to said partition for moving the blade means and the partition relative to said guard and for thereby shearing hair projecting into said first compartment through said perforations, and for removing the sheared hair from said first compartment to said second compartment.

4,000,561

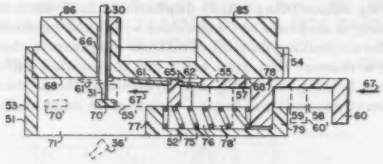
DEVICE FOR SEVERING TUBULAR MEMBERS

Horst K. Wieder, 1207 Riverview Lane, Watertown, Wis. 53094, and Klaus A. Wieder, Rte. No. 1, Helenville, Wis. 53137

Filed July 14, 1975, Ser. No. 595,719

Int. Cl.² B26B *13/22*

U.S. Cl. 30—124 **7 Claims**



1. In a device for transversely severing a polymeric synthetic resinous artificial insemination tube,

a first housing member having a bottom and side walls,

an elongated slide member having two ends,

a second housing member,

a spring, and

a cutting blade,

said slide member:

slidably received in a portion of said first housing member, and

having at one of its ends a handle portion which extends outside said first housing member, and

having said blade attached to it at its other end,

said first housing member:

having means for attaching it to said second housing member, and

having means to slidably receive said slide member, and

having an aperture in a sidewall to receive said handle portion of said slide member, and

having abutting means to abut a portion of said slide member adjacent to said handle portion to prevent sliding removal of said slide member through said sidewall, and

having means to receive said spring,

said spring disposed in said first housing member to bias said slide member against said abutting means,

said second housing member:

having means to attach it to said first housing member, and

abuttable to a surface of said slide member to retain said slide member in said portion of said first housing member in which it is slidably received, and

having an aperture to guide a tube to be severed into the path of said blade,

wherein said first and second housing members are attached by resiliently deformable interlocking portions of said attaching means which are provided as part of one of said housing members being interlocked with corresponding interlocking portions provided as attaching means as part of the other of said housing members.

4,000,562

VACUUM HAIRCUTTING APPARATUS AND METHOD

Constantino J. Alevras, 542 Gruman Court, Riverdale, N.J. 07675

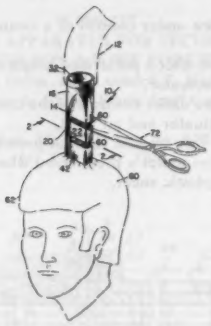
Filed May 29, 1975, Ser. No. 581,843

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B26B *19/20, 19/44*

U.S. Cl. 30—133 **6 Claims**

1. Vacuum haircutting apparatus comprising an elongated hollow tapered body having an open upper end and an open bottom end and forming an elongated chamber, said tapered body being provided with additional opening means at graduated intervals along its length communicating with said chamber, so that the application of a source of vacuum suction to



said open upper end while said open bottom end is applied to a subject's hair results in said hair being drawn up through said chamber whereby said hair will be cuttable through said additional opening means.

4,000,563

APPARATUS FOR DRYING OR COOLING PARTICULATE MATERIAL WITH A GAS

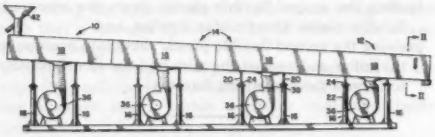
John A. Cubitt, Mossley via Ashton-under-Lyne, and Henry Ellwood, Rochdale, both of England, assignors to USM Corporation, Boston, Mass.

Filed Feb. 13, 1975, Ser. No. 549,834

Claims priority, application United Kingdom, Feb. 16, 1974, 7167/74

Int. Cl.² F26B *3/08*

U.S. Cl. 34—10 **1 Claim**



1. Apparatus for treating particulate material with a gas comprising:

a. a body unit having upper and lower interior sections;

b. a chamber for receiving particulate material formed in the upper interior section of the body unit;

c. a trough constructed in the receiving chamber and having an elongated opening extending along its bottom; said trough being formed by two pairs of opposing imperforate side walls, an upper pair sloping downward at a first angle and a lower pair sloping downward at a second angle, said first angle being greater when compared to a horizontal than said second angle, the juncture of upper and lower walls having a slot constructed therein for the direction of incoming gas towards the bottom of the receiving chamber;

d. a pressure chamber formed in the lower interior section of the body member, said chamber communicating directly with the slot in the trough;

e. a barrier constructed of perforate material located between the pressure chamber and the receiving chamber to prevent the particulate material from entering the pressure chamber but to allow the flow of gas therethrough;

f. a source of pressurized gas connected to the pressure chamber to supply gas to said chamber, said gas being under sufficient pressure to cause a flow of gas through

the slot into the receiving chamber and cause circulation of the particulate material in the receiving chamber; and

g. means for supporting the body unit to allow the trough to be inclined, thereby providing a generally downward path for the particulate material.

4,000,564

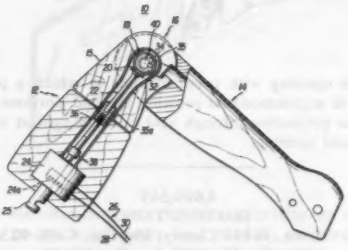
PROGRAMMABLE ANTHROPOMORPHIC ARTICULATION

Mark P. Haffner, New Carrollton, Md., and Robert S. Pizer, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Jan. 7, 1976, Ser. No. 647,317

Int. Cl.² G09B *23/32*

U.S. Cl. 35—17 **7 Claims**



1. A joint, two limb portions joined by said joint, and a magnetic particle brake having a braking torque responsive to current, positioned on one of said portions, a mechanically coupled to said joint, whereby the resistance of the limb portions about said joint is responsive to the brake current.

4,000,565

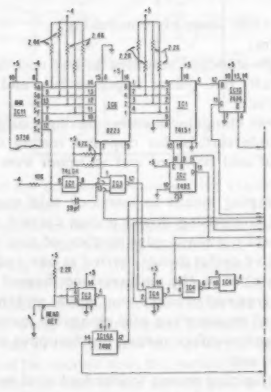
DIGITAL AUDIO OUTPUT DEVICE

Albert W. Overby, and Donald P. Parks, both of Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1975, Ser. No. 574,828

Int. Cl.² G06K *9/00;* **H04M** *1/00;* **G06F** *7/38*

U.S. Cl. 35—35 A **5 Claims**



1. Apparatus for converting silently displayed visual data characters into serially sequenced, tone coded audible data signals, at a rate of presentation between and duration of said serially sequenced tones to be auditorially intelligible to humans, comprising:

a source of first electrical drive signals of the type for operating a visual data display means;

converting means connected to said source of first electrical drive signals for converting said first electrical drive signals into serially sequenced and tone coded second electrical drive signals;

tone signal rate control means and tone signal duration control means connected to said converting means for controlling the rate and duration of said second electrical drive signals to produce a rate of presentation and duration of said signals to be auditorially intelligible to humans; and

transducer means connected to said converting means to receive said serially sequenced and tone coded second electrical drive signals for audibly and serially producing tones corresponding in frequency, rate and duration to said sequenced and tone coded second electrical drive signals.

4,000,566

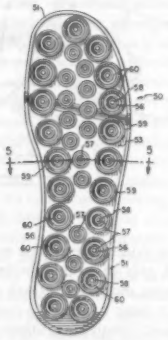
SHOCK ABSORBING ATHLETIC SHOE WITH AIR COOLED INSOLE

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.

Filed Apr. 22, 1975, Ser. No. 570,438

Int. Cl.² A43B *13/18, 7/06, 13/04*

U.S. Cl. 36—28 **4 Claims**



1. A homogeneous unit sole construction comprising

a. a one-piece molded sole of resilient elastomeric material having a bottom tread surface and an upper foot supporting surface;

b. the lowermost portion of said sole is specifically contoured to define a continuous peripheral rim and a plurality of primary shock absorbing cylindrical means disposed inwardly thereof and spaced thereform and from one another by first recessed annular portions;

c. the bottom surfaces of said shock absorbing cylindrical means being disposed in a common plane with the bottom surfaces of said peripheral rim means;

d. each of said cylindrical shock absorbing means containing a secondary mini-cylindrical shock absorbing means concentric therewith;

e. said mini-shock absorbing means being defined by second annular recess portions defined in the lowermost portions of said aforementioned primary cylindrical shock absorbing means, said first annular recess portions being deeper than said second annular recess portions with respect to the bottommost surfaces of said unit sole;

f. annular tread means disposed concentrically with a predetermined number of said aforementioned primary shock absorbing means and said secondary mini-shock absorb-

ing means; the bottom surfaces of said primary shock absorbing means, said secondary shock absorbing means, and said tread means being disposed in a common plane with said bottom surfaces of said peripheral rim means;

g. said primary and secondary shock absorbing means being of sufficient depth so as to be compressible and laterally flexible in a manner whereby shock absorption is accommodated in three dimensions, along the X, Y and Z-axes of each of said shock absorbing means;

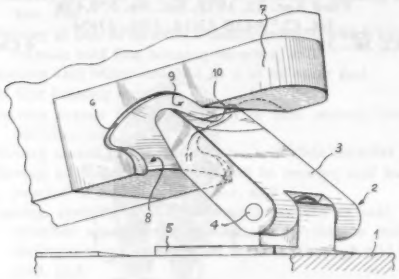
h. said sole being of non-uniform thickness along its length from heel portion to shank portion to toe portion, said heel portion having a thickness substantially greater than said toe portion and said shank portion being thicker than said heel portion; and

i. said toe portion being substantially elevated with respect to said shank portion.

4,000,567
SKI BOOT

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Division of Ser. No. 555,866, March 6, 1975, Pat. No. 3,942,811. This application Dec. 29, 1975, Ser. No. 644,452
Claims priority, application France, Mar. 6, 1974, 74.07643
Int. Cl.² A43B *5/04*; **A63C** *9/00*
U.S. Cl. 36—117 **9 Claims**



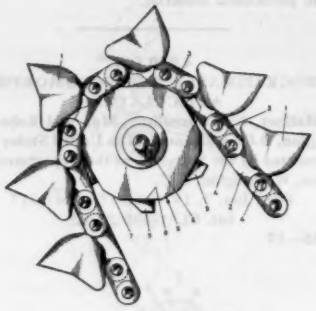
1. A ski boot providing automatic recentering of the boot on the longitudinal axis of a ski binding comprising a mobile catch; said ski boot including, at one end thereof, underneath and in the sole, a ramp adapted to cooperate with said mobile catch, said ski boot comprising, above said ramp, a downwardly-oriented sliding surface adapted to engage at least partly, during the boot fitting operation, a corresponding shape arranged in said mobile catch.

4,000,568
BUCKET DREDGER

Jacobus M. Donkers, Zaandam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed July 14, 1975, Ser. No. 595,432
Claims priority, application Netherlands, July 18, 1974, 7409757
Int. Cl.² E02F *3/14*
U.S. Cl. 37—69 **3 Claims**

1. A bucket dredger having a bucket chain guided over a rocker, said bucket chain comprising a plurality of buckets pivotally interconnected by pins to form an endless chain, the rocker having the shape of a polygon with sides having a length corresponding to the length of the frame members of the buckets, the buckets being interconnected by links arranged between each two buckets, said links being pivotally connected to the buckets by means of said pins and having a length which is substantially shorter than the length of the frame member of the buckets, the polygonal sides of the rocker having alternately a length corresponding to the length of the frame members of the buckets and to the length of the links situated between the buckets, each link comprising an

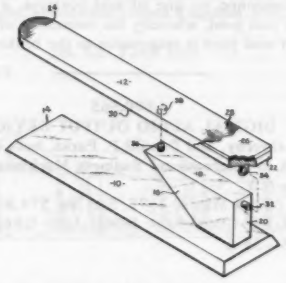


elongated opening with rounded ends in which a pressure member is accommodated pressing the end portions of two pivot pins projecting through said opening against opposite ends of said opening.

4,000,569
IRONING TABLE

Monte A. Carson, 18144 Cherry, Hisperia, Calif. 92345

Filed May 27, 1975, Ser. No. 581,286
Int. Cl.² D06F *81/00*
U.S. Cl. 38—135 **5 Claims**



1. An iron table assembly comprising:

a. a platform;

b. an upright standard mounted to one end thereon with a substantially flat, planar upper surface and an outboard edge surface;

c. at least one elongated member having a substantially flat, planar undersurface for opposed resting on the upper surface of said standard and an upper iron-working surface;

d. first clamping means to interlock said member to said standard comprising dowel means carried on the upper end of said outboard edge surface of said standard and cooperative eyelet means carried at one end of said elongated member on the undersurface thereof to be slipped over the free end of said dowel means and thereby engage said dowel means when said elongated member is placed with its undersurface resting on the upper surface of said standard; and

e. second clamping means to interlock said member to said standard comprising key means carried at the inboard end and on said upper surface of said standard and cooperative keyway means carried at an intermediate position on the undersurface of said elongated member to engage

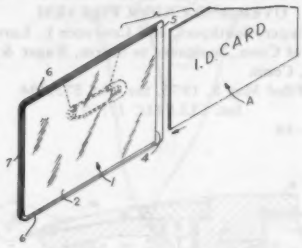
said key means when said elongated member is placed with its undersurface resting on the upper surface of said standard.

4,000,570

IDENTIFICATION CARD HOLDER

Norman Carmen, 4101 Powder Mill Road, Beltsville, Md. 20705

Filed Sept. 9, 1975, Ser. No. 611,714
Int. Cl.² A44C *3/00*
U.S. Cl. 40—1.5 **4 Claims**



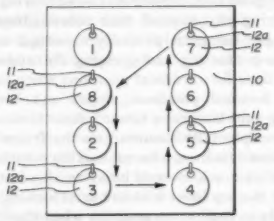
1. An identification card holder comprising an envelope having a transparent front, a back partially attached to said front along corresponding edges thereof with an opening between said front and back for receiving a card therethrough, said back having a pair of openings in an internal portion and a flap portion extending from said openings to an edge of said back, said flap having an outer edge affixed to an edge of said front, and a safety pin having one leg thereof extending through said back openings.

4,000,571

SCHEDULING BOARD AND METHOD OF USE THEREOF

Jack M. Harrison, 49 W. Malvern Ave., Salt Lake City, Utah 84115

Filed Mar. 10, 1975, Ser. No. 556,789
Int. Cl.² G09F *3/18*
U.S. Cl. 40—19.5 **4 Claims**



1. Apparatus for scheduling competitive events comprising a backing member;

participant identification means arranged in paired first and second rows on the backing member and

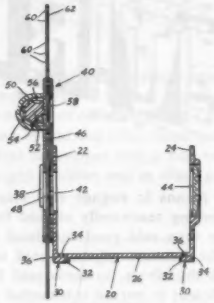
means allowing rotating of the participant identification means such that the relative position of one fixed participant identification means at one end of the first row does not change while the participant identification means at the other end of the first row moves to the corresponding other end of the second row, the participant identification means at the one end of the second row is moved to the first row next to the fixed participant identification means, each other participant identification means in the first row is moved to the position of the next adjacent participant identification means in the direction of the other end of the row and each other participant identification means in the second row is moved to the position of the next adjacent participant means in the direction of the one end of the other row.

4,000,572

MAILING VIEWER FOR SLIDES AND THE LIKE

Paul G. Kiehl, St. Louis, Mo., assignor to Visual Data Corporation, Chesterfield, Mo.

Continuation of Ser. No. 404,019, Oct. 5, 1973, abandoned, which is a division of Ser. No. 307,107, Nov. 16, 1967, Pat. No. 3,800,452, which is a continuation of Ser. No. 57,179, July 22, 1970, abandoned. This application Apr. 15, 1976, Ser. No. 677,017
Int. Cl.² G02G *27/22;* **G09F** *11/30*
U.S. Cl. 40—63 A **11 Claims**



8. A collapsible flat mailing viewer and advance mechanism for viewing film strips comprising in combination a central panel, a lens panel, a film receiving panel, hinge means for joining the lens and film panels along opposite ends of said central panel with said central panel directly therebetween and for folding said lens and film panels about the hinge means relative to said central panel to an opposed generally parallel relation, and means for releasably maintaining said lens and film panels in opposed parallel relation for viewing of a film strip, an advance mechanism, means for removably mounting said advance mechanism to said film receiving panel, and slot means for receiving and holding a film strip at said film receiving panel with said film strip generally straight and parallel to said film receiving panel as it moves thereover for sliding movement of the film strip within the slot means for successively viewing picture frames, said slot means being unobstructed at opposite ends to permit movement of the film strip past opposite ends of the film receiving panel said slot means is oriented for movement of the film strip past top and bottom ends of the film receiving panel, said advance mechanism including means for moving the film strip within the slot means for successively viewing picture frames and a rotatable sprocket adapted to engage with feed apertures of the film strip, said sprocket being mounted with the axis normal to the direction of movement of the film strip.

4,000,573

MARQUEE LETTERS

Sy Cohen, Los Angeles, Calif., assignor to Visual Components, Inc., Canoga Park, Calif.

Filed Oct. 30, 1975, Ser. No. 627,441
Int. Cl.² G09F *7/02*
U.S. Cl. 40—142 R **6 Claims**

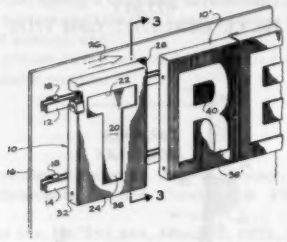
1. A letter for use on a lighted marquee, comprising:

an opaque tray-like member having a front panel, first and second side walls and top and bottom walls integral therewith, each of said walls extending at least a predetermined distance rearwardly from said front panel whereby to project said front panel from said marquee, said front panel being formed with an indicia opening therethrough, said top bottom, first and second side walls defining a substantially continuous rim for said front panel whereby the escape of light from said marquee in the direction of a viewer is substantially precluded;

Flexible translucent color panel interchangeably secured subadjacently of said front panel for providing color for said indicia opening whereby one can selectively highlight said indicia;

a lip integrally coextensive with said first side wall and extending laterally outwardly and parallel to said front panel for a substantial distance therefrom so as to overlap with the second side of a letter of like construction placed immediately adjacent thereto;

brackets connected to said letter, at least one adjacent each of said first and second side walls, each having a portion



formed with means to engage said marquee, each said portion projecting rearwardly of said front panel a distance greater than said predetermined distance of said side walls, the bracket adjacent said second side wall being spaced therefrom, towards said first side wall, a distance sufficient to permit substantial overlap with the lip of a letter of like construction placed adjacent thereto, and

framing means including flange means on at least one major portion of a pair of opposed walls whereby said panel may be slid between said flange means and said front pane.

4,000,574

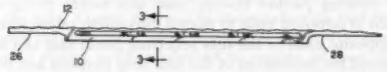
RIB FOR HANDGUN

Richard F. Grant, South Windsor, Conn., assignor to The Poly-Choke Company, Incorporated, East Hartford, Conn.

Filed Aug. 8, 1975, Ser. No. 603,006

Int. Cl.² F41G *1/46*

U.S. Cl. 42—1 S **3 Claims**



1. A gun sight rib for mounting on a barrel of a handgun, the handgun barrel having a sight extending upwardly therefrom adjacent the muzzle end thereof, said rib including:

an elongated rib body, said rib body having a central portion and oppositely disposed end portions, said end portions being of reduced thickness when compared to said central portion, the upper surfaces of said end and central portions cooperating to form said rib body upper surface, said rib body central portion having a curved lower surface contour to conform with the shape of the upper surface of the barrel of a handgun, said reduced thickness end portions respectively defining muzzle and chamber ends of said rib body;

a central serrated portion on said rib body upper surface, said central serrated portion extending from said chamber end to said muzzle end of said rib body to provide a sight plane;

smooth edge portions on each side of said central serrated portion on said upper surface; and

a notch extending through said rib body end portion at the muzzle end thereof, said notch communicating with the muzzle end of said rib body and having a depth and width sufficient to accept the front sight of a handgun whereby the front sight will be surrounded by said rib on three sides.

4,000,575

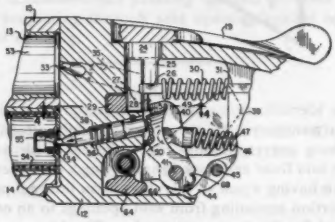
MEANS FOR RETRACTION OF LOWER FIRING PIN OF OVER-AND-UNDER FIREARM

William B. Ruger, Southport, and Lawrence L. Larson, Bethany, both of Conn., assignors to Sturm, Ruger & Co. Inc., Southport, Conn.

Filed May 8, 1975, Ser. No. 575,804

Int. Cl.² F41C *11/10*

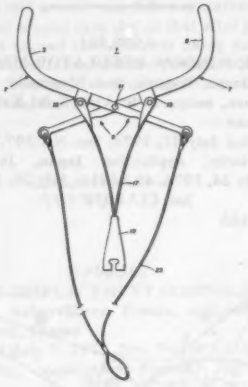
U.S. Cl. 42—44 **4 Claims**



1. In an over-and-under break-open fire-arm having a frame; upper and lower barrels secured together and pivotally mounted on the frame for rotation from their closed ready-to-fire position to their open loading-and-unloading position; upper and lower firing pins mounted for longitudinal movement on the frame, the forward ends of said upper and lower firing pins extending, respectively, into the rearward ends of the upper and lower barrels at the longitudinal axes thereof when said firing pins are at their forwardmost positions, said firing pins being withdrawn from the rearward ends of said upper and lower barrels when said firing pins are at their rearwardmost positions; upper and lower firing pin springs urging said firing pins toward their rearwardmost positions; upper and lower hammers pivotally mounted on the frame, said hammers contacting and pressing the upper and lower firing pins to their forwardmost positions when said hammers are at their forward positions; upper and lower hammer springs urging said hammers toward their forward positions; and a top lever pivotally mounted on the frame for rotation about its vertical axis from a barrel locking position to a barrel unlocking position, said barrels being retained at their closed position when the top lever is at its barrel locking position and being rotatable to their open position when the top lever is at its barrel unlocking position; the improvement in means for retracting the lower firing pin from contact with a cartridge contained in the lower barrel which comprises:

a hammer and firing pin retracting cam disposed on the top lever at the lower end thereof, said retracting cam being radially offset with respect to the vertical axis of the top lever and being positioned to permit the lower hammer to contact and press the lower firing pin forwardly when the top lever is at its barrel locking position and being positioned to contact the lower hammer and to move it rearwardly when the top lever is rotated from its barrel locking position to its barrel unlocking position, thereby permitting the lower firing pin spring to move the lower firing pin rearwardly and thus withdraw it from the rearward end of the lower barrel.

4,000,576
CLAMPING APPARATUS
Claude Elmer Jones, 1406 W. 9th St., Freeport, Tex. 77541
Filed Oct. 2, 1975, Ser. No. 618,862
Int. Cl.² A01K *97/14*
U.S. Cl. 43—5 **5 Claims**



1. A clamping apparatus comprising:

a clamping device operable between opened and closed positions, said clamping device including first and second clamping members, each of said clamping members having a clamping section with a blunt clamping surface and an extended section, said clamping members being pivotally connected together at a common point between said clamping and extended sections thereof, said clamping sections being arranged to cross over one another when said clamping device is in the closed position;

a biasing device connected to each clamping member at a point between said common point and each clamping section, said biasing device being operable to exert a force on said clamping device tending to hold said clamping device in said closed position;

handle means having first and second ends, said first end of said handle means being connected to said biasing device, said second end of said handle means being remote from said clamping device, said clamping device and said biasing device together further including holding means operable to hold said clamping device in said opened position; and

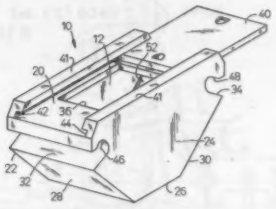
actuating means comprising a resilient line connected to the end of each extended section of each clamping member, said resilient line being extendible therefrom to said remote end of said handle means, said actuating means being selectively operable from an actuating point remote from said second end of said handle means, for releasing said holding means whereupon said clamping device is allowed to return to said closed position.

4,000,577
FISH BAIT BOX
O. W. Kelley, Mequon, Wis., assignor to Oxbow Products, Inc., Mequon, Wis.
Filed Dec. 29, 1975, Ser. No. 644,713
Int. Cl.² A01K *97/04*
U.S. Cl. 43—55 **13 Claims**

1. In a fish bait box having an upper wall and having a chamber therein live bait and a shiftable medium for said live bait;

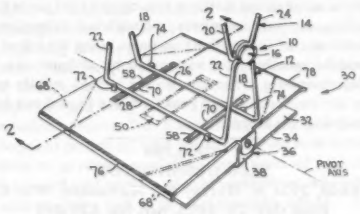
an opening in said upper wall of said box affording access to said chamber and from which bait is withdrawn; and

means on the exterior of said box to enable said box to rest in and be tilted between an upright position and at least one other tilted position, whrerby during tilting the medium is shifted from one end of said compartment toward the other, said means on the exterior of said box comprising a first surface on which said box rests when in said



upright position, said first surface being opposite said upper wall, and a second surface slanting upwardly at an angle from one end of said first surface and on which said box rests when in said one other tilted position, said angle being such that said upper wall is non-vertical when said box is in upright position and in tilted position.

4,000,578
TRIGGER-ASSEMBLY FOR ROTATING-FRAME TYPE ANIMAL TRAPS
Anthony J. Souza, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Feb. 3, 1976, Ser. No. 654,768
Int. Cl.² A01M *23/26*
U.S. Cl. 43—92 **8 Claims**



1. A treadle assembly for use in combination with a rotating frame type in which pairs of opposed jaw bars are disposed in adjacent relationship when the trap is cocked and in which the jaw bars are forcibly urged toward each other when the trap is uncocked, comprising base means for resting on a support surface and including portions for defining opposite runs from which animals to be trapped may approach the trap; treadle-lever means comprising a generally plate-like element overlying said base means and normally spaced thereabove; fulcrum means between said base and treadle-lever means defining above said base means a pivot axis for said treadle lever means transversely between the portions defining the opposite runs for the animals, said treadle-lever means comprising opposite operating-lever portions for the treadle assembly, said base means having vertically-extending abutment means thereon extending toward said operating-lever portions for dislodging at least one jaw bar of a cocked trap off the treadle-lever means when the trap is actuated, said treadle-lever means including orienting means for opposed jaw bars of the cocked rotating-frame type trap for retaining the trap jaws in a cocked condition until the vertically-extending abutment means dislodges the one jaw bar off the orienting means when the trap is actuated.

4,000,579

ANIMATED CLACKER

Victor Joseph Gornall, 11423 Nashville, Detroit, Mich. 48205

Filed June 13, 1975, Ser. No. 586,531
Int. Cl.² A63H *5/00*
U.S. Cl. 46—154 **3 Claims**

1. A device comprising

an elongate one-piece clacker element of essentially stiff but flexible sheet material having a middle member and end flap members joined to said middle member along spaced score lines which diverge substantially uniformly from the opposite ends of said middle member,

said middle member having relatively long, free, gripping edges at the ends thereof of sufficient length to receive and comfortably accommodate the thumb and finger of one hand,

whereby alternate endwise compression and release of said middle member causes the latter alternately to arch and straighten and said flap members to swing toward and from each other about said score lines and the edge portions of said flap members to strike each other with force,

said clacker element having in combination therewith animation parts attached to said members so that movement of the latter in use causes said parts to move relative to said members in simulated animation,

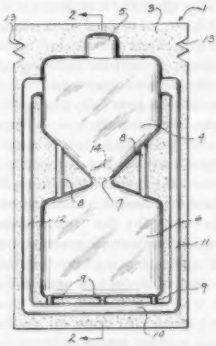
at least one of said animation parts being attached to said middle member and supported by at least one of said flap members, whereby flexure of said middle member in use causes said one part to move in and out between said flap members.

4,000,580

SEED GERMINATOR

Roy A. Biehl, 2934 N. Murray St., Milwaukee, Wis. 53211

Filed Oct. 24, 1975, Ser. No. 625,493
Int. Cl.² A01C *1/02*; **A01G** *9/02*; **B65D** *25/54*, *73/00*
U.S. Cl. 47—14 **8 Claims**



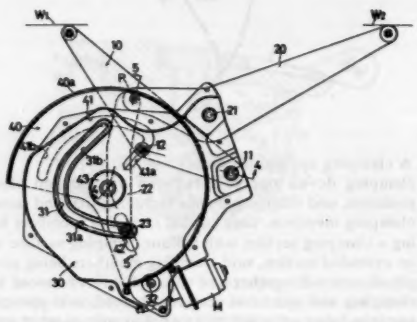
1. A seed germinator for observing the germination of a seed and performing botanical experiments comprises a unitary closed body formed by sealing a flat back sheet and a thermo-formed front sheet about their top, bottom and side edges, said body having a germination chamber, a nutrient chamber positioned below the germination chamber and connected thereto by a narrow throat, a closed water reservoir located adjacent said nutrient chamber, at least one channel connecting the nutrient chamber to the water reservoir, and at least one recycling channel connecting the water reservoir to the germination chamber so that excess water can be returned to the germination chamber.

4,000,581

VEHICLE WINDOW REGULATOR MECHANISM

Ryoichi Fukumoto, Nagoya, and Masatoshi Fujita, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed July 21, 1975, Ser. No. 597,736
Claims priority, application Japan, July 23, 1974, 49-84391; July 24, 1974, 49-84916; July 30, 1974, 49-87226
Int. Cl.² E05F *5/12*
U.S. Cl. 49—103 **5 Claims**



1. A vehicle window regulator mechanism comprising:

a base plate secured to a vehicle door;

a sector gear pivotally mounted upon said base plate;

a drive pinion gear for rotating said sector gear about the pivot axis thereof;

a first regulator arm pivotally mounted upon said base plate and supporting a first window glass section;

a second regulator arm pivotally mounted upon said base plate and supporting a second window glass section;

a plurality of cam slots provided in said base plate and said sector gear comprising a first cam slot provided in said sector gear and having a straight inclined section radially directed toward the pivot axis of said sector gear and an arcuate section continuous with said straight inclined section and being concentric to the pivot axis of said sector gear, a second cam slot provided in said sector gear and a third cam slot provided in said base plate;

first and second cam followers, a link member having one end pivotally mounted on one end of said second regulator arm;

said first cam follower secured to said first regulator arm intermediate the ends of the first regulator arm and movably disposed in said first cam slot;

said second cam follower secured to the other end of said link member and movably disposed in said second and third cam sots, said second cam slot having an arcuate section concentric with the pivot axis of said sector gear and said third cam slot having a curved section circumferentially provided in said base plate and extending toward the pivot axis of said link member whereby upon rotation of said sector gear said first cam follower rotates said first regulator arm by travelling in said first cam slot to raise or lower said first window glass supported on said first regulator arm while said second cam follower will traverse the entire length of said second cam slot during the initial

rotation of said sector gear in opposite directions so that upon rotation in the window lowering direction said second cam follower will not be moved along the third cam slot to lower said second window glass section until said first window glass section is lowered by movement of said first cam follower along the straight section of said first cam slot and upon rotation in the window raising direction said second cam follower will not be moved along said third cam slot to raise said second window glass section until said second cam follower traverses the entire length of said second cam slot so that after partial movement of said second cam follower along said third cam slot said first cam follower will enter said straight section of said first cam slot to thereafter raise both window glasses simultaneously.

4,000,582

OBLIQUE-DISPLACEMENT SLIDING DOOR

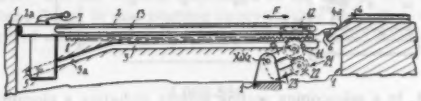
Bernard Monot, Aubervilliers, France, assignor to Faiveley S.A., Saint-Ouen, France

Filed July 7, 1975, Ser. No. 593,457

Claims priority, application France, July 18, 1974, 74.24987

Int. Cl.² E05D *15/10*

U.S. Cl. 49—218 **6 Claims**



1. An oblique-displacement sliding door comprising a stationary frame and at least one sliding leaf associated with guiding means connected to the door-frame for engaging the leaf transversely within said frame in the position of closure and for disengaging said leaf from said frame in the opposite direction at the commencement of the opening movement, operating means being provided for producing action on the leaf in the direction of sliding motion, the door being additionally equipped with a leaf-stabilizing system in which provision is made on the leaf for two separate toothed racks which are parallel to the direction of sliding motion and each associated with a pinion supported by a carriage retained by a guide which is parallel to said toothed rack, the two pinions aforementioned being coupled by means of a coordinating shaft which is transverse to said guides, two pivotally mounted stabilizing crank-arms each having one end connected to a carriage and the other end connected to the door-frame, the axes on which the two crank-arms are pivoted to the frame being in substantially coincident and parallel relation to the coordinating shaft, the operating means being such as to comprising a reversible motor and a mechanism for driving the pinions of the leaf-stabilizing system in rotation, wherein the motor aforementioned and the drive mechanism are rigidly fixed to at least one of the two crank-arms which are pivotally mounted on said door-frame, said motor and drive mechanism being located on the same side as the stabilizing pinions with respect to the axis on which the crank-arms are privoted to the door-frame, thereby to apply opposite orientation torques on the crank-arms with the opposite directions of action of the motor, for the transverse engagement of the door-leaf and for maintaining the door-leaf in the door-frame in one direction of action of the motor, and for the disengagement of the door-leaf from the door frame in the other direction of action of the motor.

4,000,583

BELT-TYPE ABRADER WITH MEANS TO COMPENSATE FOR TOOL WEAR

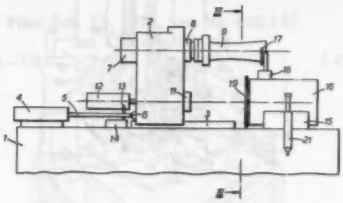
Arthur Royden Stevens, Torquay, England, assignor to Centrax Limited, England

Filed Jan. 9, 1975, Ser. No. 539,846

Claims priority, application United Kingdom, Jan. 15, 1974, 1830/74

Int. Cl.² B24B *21/18, 49/00*

U.S. Cl. 51—135 R **14 Claims**



1. In a copying machine tool comprising a base, a first mounting supported by said base for carrying a workpiece and a master cam, a second mounting supported by said base, a cam follower mounted on said second mounting, a plurality of pulleys, a flexible abrasive belt supported by said pulleys, one of said pulleys being mounted on said second mounting in a position to press said belt against said workpiece to remove material from the surface thereof, a motor for driving another of said pulleys, at least one of said first and second mountings being movable relative to said base, and means for moving said movable mounting or mountings to move said one of said pulleys towards said surface of said workpiece, said movement being limited by engagement of said cam follower with said master cam, whereby the position of said abrasive belt relative to said workpiece is determined by the configuration of said master cam, so that said workpiece is brought to a predetermined configuration, the improvement comprising:

compensating means having a body portion and an output member, said output member being arranged for progressive compensating movement at a predetermined rate relative to said body portion; and

transmission means for transmitting said compensating movement to one of said workpiece and said one of said pulleys to produce a relative movement of said abrasive belt toward said surface of said workpiece, whereby wear of said abrasive belt is at least partially offset.

4,000,584

IN-SITU LAPPING APPARATUS FOR GATE VALVES

Tadao Uyetake, Honolulu; Teikichi Higa, Pearl City; Stephen Orillo, Jr., Wahiawa, and Gregory Nakano, Pearl City, all of Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1976, Ser. No. 672,579

Int. Cl.² B24B *19/00*

U.S. Cl. 51—241 VS **10 Claims**

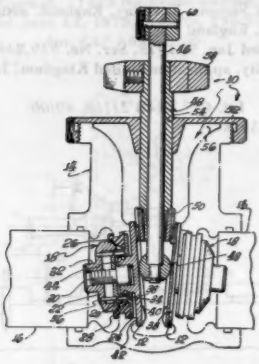
1. A lapping apparatus for in-situ grinding of valve body seats of a gate valve comprising:

plug means expandable within the inlet and outlet openings of the gate valve for retention therein;

means rotatably mounted on the plug means with freedom of reciprocable movement along the axes of rotation for grinding the valve body seats;

means extendable into the valve body for engaging the

grinding means and biasing the grinding means along the axes of rotation against the valve body seats, and



means extendable into the valve body for engaging and driving the grinding means about said axes of rotation.

4,000,585

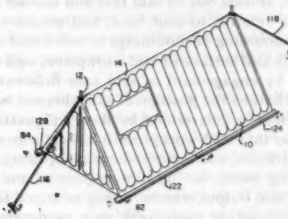
INFLATABLE COLLAPSIBLE TENT

Salvatore Denaro, 133 Westmont Ave., Toronto, Ontario, Canada

Division of Ser. No. 565,399, April 7, 1975, Pat. No. 3,957,069. This application Mar. 4, 1976, Ser. No. 664,009

Int. Cl.² E04B *1/345*; **A45F** *1/16*

U.S. Cl. 52—2 **10 Claims**



1. A collapsible tent comprising:

a tent frame comprising cooperating tubular support pieces adapted to form a triangular tent-style configuration;

a one-piece inflatable tent covering comprising a pair of side wall panels, a floor panel, four end panels, each of said panels comprising two sheets of pliable material joined together in parallel seal lines thus delineating parallel inflatable tubular cells, said tent covering adapted to cover said tent frame and be secured thereto;

expandible plugs adapted to secure the frame to the ground at each of the corners and at the mid-point of the width support pieces and the length support pieces, said plugs at each of the corners comprising:

a lower plug means consisting of two symmetrical semi-circular portions, the inside surfaces of which are screw-threaded, and the outer diameter of said lower plug means being reduced towards the lowermost part and terminating in a point, the inner diameter of said lower plug means tapering inwardly to the point where the outer diameter diminishes, said lower plug means having a fixed ring circumferentially affixed to the upper portion of said plug means and an expandible ring circumferentially affixed to the upper portion of said plug means and an expandible ring circumferentially affixed to the lower portion of said plug means;

a screw means consisting of a uniform cylindrical screw complementary to said screw-threading of said lower plug means;

a handle means adapted to screw said screw means into said lower plug means whereby the lower portion of said lower plug means expands when said screw means is inserted into said lower plug means;

means adapted to secure the frame of the tent to said expandible plug comprising a base plate with a hole therethrough through which the screw means is inserted into said lower plug means, and three short hollow tubes affixed to said base plate adapted to receive respective portions of the tent frame.

4,000,586

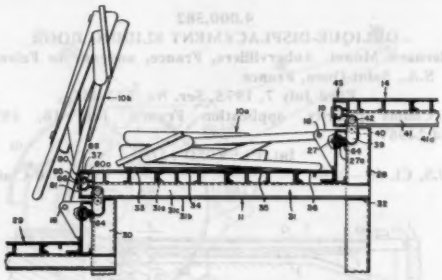
SYSTEM FOR MOUNTING ARTICLES TO TELESCOPIC STRUCTURES

Richard A. Vance, and Robert S. Walworth, both of Champaign, Ill., assignors to American Seating Company, Grand Rapids, Mich.

Filed Apr. 11, 1973, Ser. No. 349,959

Int. Cl.² E04H *3/12*

U.S. Cl. 52—9 **13 Claims**



1. In a telescoping seating system including a plurality of telescoping platform sections, the improvement comprising: an elongated metal extrusion forming a lateral beam of said platform sections, said beam including a vertical web defining an elongated horizontal slot; a channel housing providing upper and lower horizontal members extending rearwardly of said vertical web adjacent said horizontal slot, said channel housing being located in the upper third of the vertical center web of said beam, and a vertical back portion in interconnecting the distal ends of said upper and lower horizontal members of said housing; upper and lower horizontal web portions extending rearwardly from said vertical back portion of said housing, said housing shape providing greater beam strength to resist horizontal and vertical deflection; a plurality of folding chairs; and means for pivotally mounting the lower leg portions of said chairs to said beam in said slot, whereby said chairs may be adjusted laterally within said slot.

4,000,587

GUTTER STRUCTURE

William H. Weber, 8182 Clifton Court, Mentor, Ohio 44060

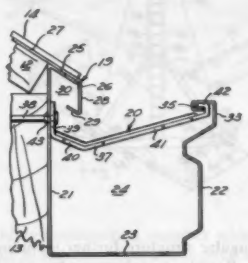
Filed Feb. 5, 1975, Ser. No. 547,121

Int. Cl.² E04D *13/06*

U.S. Cl. 52—16 **11 Claims**

1. A gutter assembly comprising a gutter member and a roof plate, and a building structure having a roof board and a facia board; said roof board being a part of a roof of said building and having a predetermined angular slope relative to said facia board; said gutter member including a generally vertically extending back wall and a generally vertically extending front wall and a generally horizontally extending bottom wall, said back wall and front wall and bottom wall defining an open cavity adapted to receive run off water from said roof, said back wall being secured to said facia board and said back wall having at its upper end a pitching flange extending a predetermined distance in a direction toward said front wall; said roof

plate including a generally flat one-piece roof wall secured to said roof board and extending laterally in a straight line parallel to said slope of said roof board over said roof board and beyond said facia board and beyond said back wall of said gutter member and beyond said gutter member pitching flange, said roof wall terminating at an edge over said bottom wall, a connecting wall extending generally vertically downwardly from said termination edge of said roof wall a predetermined distance in a direction toward said gutter member bottom wall, said connecting wall terminating at an edge over



said gutter member bottom wall, and a cavity flange extending a predetermined distance from said termination edge of said connecting wall in a direction toward said back wall, said roof wall and connecting wall and cavity flange defining an open pitching cavity; said pitching cavity receiving said gutter member pitching flange, said gutter member pitching flange being adjacent said roof plate roof wall at one end of said gutter member, and the vertical disposition of said gutter member pitching flange in said pitching cavity varying along the axial length of said gutter member for pitching said gutter member.

4,000,588

SPACE-BOUNDING SECTIONS FOR FORMING A BUILDING OR PART THEREOF, AND METHODS OF ERECTING SUCH A BUILDING

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 336,731, Feb. 28, 1973. This application Dec. 26, 1974, Ser. No. 536,467

Claims priority, application Netherlands, Feb. 28, 1972, 7202542

Int. Cl.² E04B *1/346*

U.S. Cl. 52—71 **47 Claims**

1. A prefabricated parallelpiped space-bounding section for forming at least part of a building of a type which is adapted to be transported as a unit from a factory to the building site, the section comprising a plurality of boundary faces which define at least one parallelepiped shaped space of the section, a wall for defining a substantially complete side which extends along one-half or more of a further space of the building immediately above and adjacent to said one space, said wall being displaceably arranged on the section whereby for transport purposes it is arranged near one of said boundary faces of the section and is movable with respect to the section into a final position in the completed building, said wall in said final position being vertically disposed, having a vertical dimension at least one-half the height of said one space and defining a side of at least approximately one-half of said further space which is situated immediately above and adjacent said first mentioned space defined by said boundary faces, a further wall for defining another side of said further space which is disposed vertically at a right angle to said first mentioned wall in the completed building, said further wall being arranged for transport purposes near one of said boundary faces of the section and being movable with respect to the section into its final position in the completed building.

4,000,589

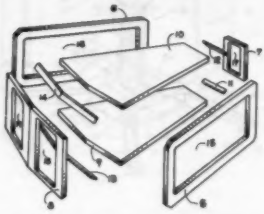
CONGRUENT MODULAR BUILDING SEGMENTS

Antonio Bianchini, 1821 Alexander Ave., Cheyenne, Wyo. 82001

Filed Feb. 13, 1976, Ser. No. 658,128

Int. Cl.² E04B *1/348*

U.S. Cl. 52—79.5 **5 Claims**



1. A building structure comprising a plurality of congruent, sector-like modular building segments joined to each other in side to side relationship, each building segment comprising in combination,

a. a roof sector and a vertically spaced congruent floor sector each having a first V-shaped end, a second narrower straight end and a pair of converging side edges extending between the first and second ends;

b. a V-shaped end wall extending between the V-shaped ends of the roof and floor sectors;

c. a straight end wall extending between the straight ends of the floor and roof sectors; and

d. a pair of congruent opposing and converging rib-frames which join the roof, floor and end walls to form an independent self-supporting building segment, each rib-frame being symmetrical about both a vertical and horizontal axis so that frames of adjacent building segments may be joined to form portions of curved or linear building arrangements.

4,000,590

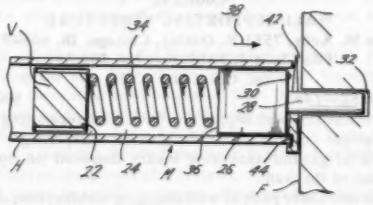
SECURITY GRILLE

Carl Kordewick, 490 Coronado Blvd., Universal City, Tex. 78148

Filed Aug. 4, 1975, Ser. No. 601,499

Int. Cl.² E04H *3/08*; **E04C** *2/42*

U.S. Cl. 52—106 **7 Claims**



3. The structure set forth in claim **1**, further including:

a key mounted with one of said vertical bars and extending laterally therefrom a sufficient distance to prevent a

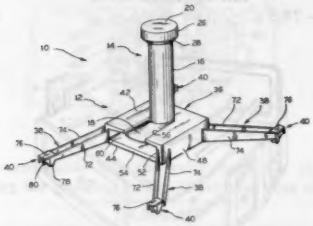
portion of said vertical bar from passing through said vertical openings in said horizontal members when said key engages said horizontal members.

4,000,591

HOLDER ADAPTED FOR SUPPORTING AN ANCHOR INSERT TO BE EMBEDDED IN A CONCRETE SLAB

Peter D. Courtois, Oceanside, Calif., assignor to Superior Concrete Accessories, Inc., San Diego, Calif.

Filed Aug. 4, 1975, Ser. No. 601,301
Int. Cl.² E04B *1/38, 1/60*
U.S. Cl. 52—125 **5 Claims**



1. A holder adapted for supporting an anchor insert to be embedded in a concrete slab, said insert including a shank having an enlarged disc-like foot on one end thereof, said holder comprising, in combination:

a box-like enclosure,

a plurality of legs extending laterally outwardly from said enclosure, and

a foot at the outer end of each leg and adapted with the remaining feet to support the enclosure in spaced relation above the floor of a concrete form,

said enclosure including

a. top and bottom walls rigidly joined together by side walls, said bottom wall being adapted for supporting said insert with the foot of the insert seated thereon,

b. means defining an entrance opening for lateral insertion of said foot into the enclosure to seat on said bottom wall,

c. a ledge on said bottom wall extending across said entrance opening for retaining said foot within said enclosure,

d. means in said enclosure forming a pocket opposite to said entrance opening and substantially conforming to the configuration of said foot, said pocket-forming means serving to limit tilting movement of the insert relative to the holder, and

e. means defining a slot in said top wall communicating with said entrance opening to accommodate the shank of said insert as said foot is inserted in said enclosure, said slot having a width less than the width of said foot.

4,000,592

WALL SUPPORTING STRUCTURE

Thomas M. Kelly, 7551 N. Oakley, Chicago, Ill. 60645

Filed June 4, 1975, Ser. No. 583,599
Int. Cl.² E04H *12/20*
U.S. Cl. 52—149 **6 Claims**

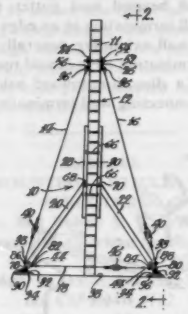
1. A temporary wall supporting device for supporting a wall in an upright position above the ground, comprising:

a pair of ground anchoring means disposed on opposite sides of the wall;

upper and lower pairs of wall-engaging members secured on opposite sides of the wall;

first and second collapsible triangular structures having a common base member extending through an opening in the wall adjacent its lower end;

said first triangular structure further including a pair of rigid strut members having their lower ends connected to said pair of ground anchoring means and their upper ends connected to one of said pairs of wall-engaging members; and



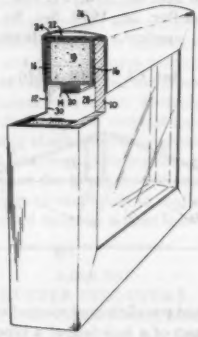
said second triangular structure further including a pair of longitudinally flexible members under tension having their upper ends connected to the other of said pairs of said wall-engaging members and having their lower ends connected to the lower end of said rigid strut members.

4,000,593

INSULATING SPANDREL GLAZING UNIT

James H. Cypher, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 65,813, Aug. 21, 1970, abandoned.
This application Oct. 10, 1972, Ser. No. 296,478
Int. Cl.² E06B *7/12;* **E04B** *2/28*
U.S. Cl. 52—172 **11 Claims**



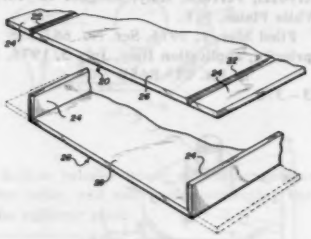
1. An insulating spandrel glazing unit comprising no more than one transparent, strengthened, glass panel and no more than one metal disposed in opposed, spaced relation to each other, said metal panel having a thickness substantially less than the thickness of said glass panel and being visible through said glass panel, the entire inner visible surface of said metal panel being provided with a uniform, continuous finish so as to present a uniform, continuous appearance through said glass panel, and marginal edge spacer means defining with said panels a closed, hermetically sealed space therebetween, wherein said glass panel has a transparent coating on its inner surface and said metal panel has a coating on its inner surface.

4,000,594

BUILDING CONSTRUCTION MEMBER

James D. Kirk, Jr., 40 N. Tower Road, Apt. 14L, Oak Brook, Ill. 60521

Filed Jan. 13, 1975, Ser. No. 540,420
Int. Cl.² E04B 2/00
U.S. Cl. 52—241 16 Claims



1. A building construction member which may be shipped to the jobsite in flat condition and formed at the jobsite into a wide, shallow, channel-shaped member with a central panel portion and having flanges extending equally and perpendicularly in the same direction from one face of the panel at opposite long edges thereof, comprising a rectangular panel of gypsum board having face laminae and a core layer of gypsum therebetween, said board having on one face thereof two V-grooves consisting of one V-groove set inwardly from each long edge for the full length of the gypsum board which penetrate the gypsum core substantially for the entire depth of said core leaving intact a sufficient thickness of the lamina of the face opposite the grooved face to act as a hinge, said grooves having adhesive means therein and defining between them a central panel portion with flanking flanges outwardly of said grooves when said flanges are hinged perpendicularly to said central panel portion and retained in that position by the adhesive means in said grooves.

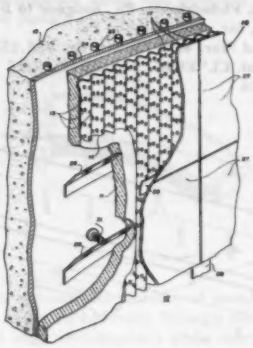
4,000,595

INSULATION STRUCTURE FOR PRESSURE VESSEL CAVITY

Peter Fortescue, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Feb. 8, 1974, Ser. No. 440,649
Int. Cl.² E04F 17/00; E04B 2/02
U.S. Cl. 52—302 8 Claims

1. In a pressure vessel cavity wherein there is a possibility of rapid depressurization, an insulation structure comprising, a layer of fibrous insulation adjacent the cavity wall, retaining means for said layer comprising a wall extending in contact therewith on the side of said layer opposite the cavity wall, said retaining means having a plurality of fluid passages therethrough communicating with said layer, isolation means for preventing circulation of fluid in said layer, said isolation means comprising a pressure barrier spaced from said layer and said retaining means on the opposite side of said retaining means from said layer to define a gas flow space between said isolation means and said retaining means for venting said layer through said fluid passages upon depressurization of the cavity, and support means secured to the pressure vessel and supporting said layer, retaining means and isolation means.

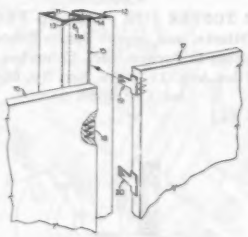


4,000,596

WALL PARTITION SYSTEM AND COMPONENTS THEREOF

Hugh Magill, No. 1 Goswell Road, Islington, Ontario, Canada, and John Alfred Herwynen, Box 364, King City, Ontario, Canada (L0G 1K0)

Filed Aug. 7, 1975, Ser. No. 602,748
Int. Cl.² E04B 5/52
U.S. Cl. 52—481 6 Claims



1. A wall system including a pair of adjacent panels each secured to a frame member by a clip;

each panel having a front surface, a rear surface and a side surface extending between said front and rear surfaces, the side surfaces of the panels being adjacent one another;

each clip having a flat body portion extending partway along the side face of a respective panel from the rear face thereof so as to be spaced from the front face of the panel, said clip body portion being secured to said panel;

each clip also having a leg integral with said body portion and extending beyond the rear face of the panel in a direction perpendicular thereto;

said frame member having a clip-receiving channel into which said clip legs extend in vertically staggered relationship;

each clip leg having a pointed tang projecting therefrom with its point directed generally towards the respective panel; and

said channel having opposed walls respectively engaged by

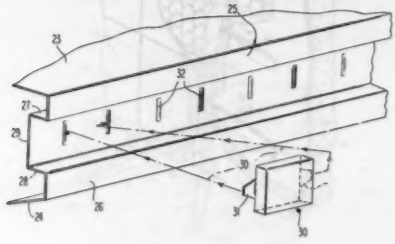
each clip leg and pointed tang to retain the panels in assembly with the frame member.

4,000,597

DECORATIVE TRIM FOR BUILDINGS

Richard Burton, Philadelphia, Pa., assignor to Burton Aluminum Classics, Inc., Philadelphia, Pa.

Filed Mar. 4, 1975, Ser. No. 555,152
Int. Cl.² E04C *2/40*; E04F *19/02*
U.S. Cl. 52—716 **7 Claims**



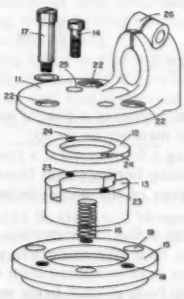
1. A building trim formed of sheet material, the trim having a shaped cross sectional profile with an elongated flat strip inset from an adjoining part of the profile and having a series of slits spaced from each other lengthwise of the strip, and decorative means comprising a plurality of elements overlying said strip and of contrasting appearance as compared with the strip, said elements being spaced from each other lengthwise of the strip and each having spaced mounting parts extended into spaced slits and interconnecting the elements with the sectional profile, thereby providing a decorative visual contrast between said elements and said strip in areas spaced lengthwise of the strip.

4,000,598

SHEAR TOPPER FOR PACKING VEGETABLES

Ralph Carl Mierke, and Joseph James Busco, both of Lyons, N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Aug. 21, 1975, Ser. No. 606,390
Int. Cl.² B65B *63/00*
U.S. Cl. 53—123 **3 Claims**



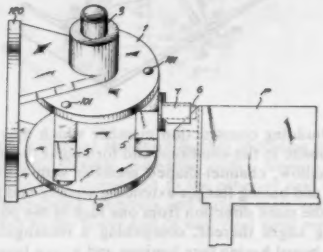
1. A device for packing elongated material in a can including a generally horizontal pad member, secured to the bottom of the pad member a generally cylindrical plunger suitable for insertion into the open end of a can, the plunger and a height-adjusting spacer being secured to the pad by suitable screws, said plunger having a vent opening to allow passage of liquid and gas therethrough, and concentric with and surrounding said plunger and on the underside of said horizontal pad member a cylindrical shearing ring spring mounted to the horizontal pad member, said shearing ring being adapted for cooperatively engaging the top flange of a open-end can to provide a cutting action when the pad member and the attached shearing ring is lowered.

4,000,599

FOLDER

Claudio Ferrozzi, Ferrara, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,295
Claims priority, application Italy, July 3, 1975, 12503/75
Int. Cl.² B65B *7/04*
U.S. Cl. 53—378 **4 Claims**



1. A folding mechanism for folding a flap of a wrapper against a face of a body of right parallelepiped form which has been already partially enclosed by the wrapper as in a tube on at least other four faces, while the partially wrapped body is translated at a uniform speed along a conveying path in a direction parallel to the said face, said folding mechanism comprising:

a. a pair of rotatable discs which face each other and are suitably spaced apart, said discs having their axes of rotation parallel to and eccentrically arranged with respect to each other, said axes of said discs being further inclined of a predetermined oblique angle with respect to the said conveying path;

b. at least one connecting rod for connecting a crank pin provided eccentrically on one of said discs with a respective crank pin provided eccentrically on the other facing disc, in such a manner that the distance between the said crank pins is equal to the distance between the axes of rotation of the two discs, whereby rotation of one of the discs causes a concurrent rotation of the other disc;

c. a folder element provided onto one of the said connecting rods,

whereby upon operation of the mechanism consequent to rotation of one of the discs in correct time relationship with the speed of translation of the body along the conveying path, the folder element engages the flap to be folded in a direction which is transverse to the direction of translation, while simultaneously accompanying the body in its translatory movement, and at the same time moving cyclically to-and-fro perpendicularly with respect to the said face of the body.

4,000,600

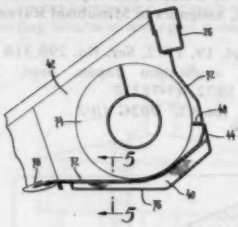
COMBINE HEADER WITH BOTTOM SUPPORT BEAM

James G. Butler, Islington, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Canada

Filed Apr. 14, 1975, Ser. No. 568,087
Int. Cl.² A01D *47/00*
U.S. Cl. 56—220 **9 Claims**

1. A crop table construction for a combine harvester comprising a main horizontal spar at the top rear and extending from side to side, a plurality of ribs attached to the spar and extending downwardly at the rear of the table and thence forwardly at the bottom of the table, a front and top skin attached to the front and top faces of the ribs, a bottom stiff-

ener plate with a front portion attached to the front and top skin, a center portion adjacent to the bottom of the ribs, and a rear portion attached to the front and top skin to form a



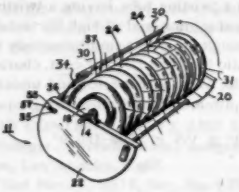
horizontal hollow tubular beam extending substantially the length of the table, and end walls connecting the spar, the skin, and the stiffener plate.

4,000,601

FRUIT HARVESTING MACHINE

Richard A. St. Petery, Jr., P.O. Box 74, Mount Royal, N.J. 08061

Filed Apr. 9, 1974, Ser. No. 459,297
Int. Cl.² A01D *46/00*
U.S. Cl. 56—328 R **11 Claims**



1. A fruit harvesting machine comprising:
a frame;
a round body mounted within the frame and having a generally soft outer surface;
a picking plate having a first portion thereof secured to the frame and having a second portion mounted adjacent to said round body and spaced therefrom a distance corresponding approximately to the diameter of fruit to be harvested;
said round body being mounted within the frame for rotation about an axis relative to the picking plate, means for rotating said body relative to the frame and the picking plate to engage said fruit between said outer surface and the picking plate to remove said fruit from its stem;
and combing means extending outwardly from the outer surface for combing through fruit laden branches upon rotation of said body for moving said fruit into the space between said round body and the picking plate, the combing means extending outwardly a distance at least equal to the diameter of the fruit.

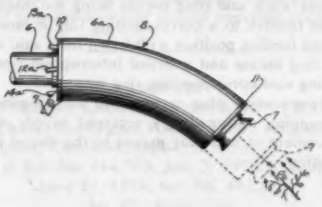
4,000,602

VACUUM CONDUIT PICK-UP DEVICE WITH IMPROVED CONTROL

Daniel E. Cardinal, Jr., 1352 Estate Lane, Lake Forest, Ill. 60045

Filed Sept. 29, 1975, Ser. No. 617,517
Int. Cl.² A01D *46/24*
U.S. Cl. 56—328 R **6 Claims**

1. A pick-up device for leaves or other materials comprising, in combination:
a. a frame,
b. an elongated longitudinally expandable flexible conduit mounted on said frame and with said conduit having an outer end mouth portion for engaging said materials,
c. means for vacuumizing said conduit so that the said materials will flow through said conduit from said mouth,
d. a plurality of tubular flexible longitudinally expandable members disposed along and generally parallel to the outer end portion of said conduit,



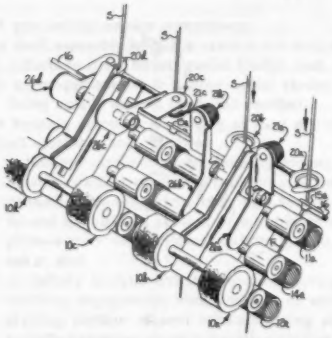
e. means to expand said plurality of members selectively different amounts to thereby flexingly tilt said conduit to a desired angle of disposition while supporting the conduit wall and holding it in relatively rigid position,
f. and means to selectively vary the length of said tilted conduit without changing its angle of disposition.

4,000,603

TEXTILE YARN SPINNING MACHINE WITH SUPPLY STRAND INTERRUPTION

Charles D. Lee, Jr., Charlotte, N.C., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Feb. 27, 1975, Ser. No. 553,795
Int. Cl.² D01H *13/18*
U.S. Cl. 57—87 **5 Claims**



1. In the combination of
a textile yarn spinning machine having a plurality of drafting systems arranged in a series, a plurality of supply strand packages each normally delivering a corresponding supply strand to a corresponding drafting system for producing a corresponding attenuated strand and a plurality of trumpet means each mounted adjacent a corresponding drafting system for directing the corresponding supply strand thereinto,
means movable along the spinning machine and having detector means for monitoring production of attenuated strands and actuator means for responding to breakage of an attenuated strand, and
means mounted on the spinning machine and selectively remotely actuable by the actuator means for interrupting feeding of the corresponding supply strand at a point in advance of introduction thereof into the corresponding trumpet means,

an improvement in the interrupting means which assures positive interruption of supply strand feeding, the improvement comprising:

a plurality of ring means arranged in a series adjacent the series of drafting systems, each said ring means being interposed between a corresponding supply package and the corresponding trumpet means for threadingly receiving the corresponding supply strand, and

a plurality of plug means for cooperating with said ring means, each said plug means being mounted for movement relative to a corresponding ring means between a strand feeding position withdrawn from said corresponding ring means and a strand interruption position penetrating said corresponding ring means,

said cooperating plug means and ring means positively entrapping a threadingly received supply strand upon movement of said plug means to the strand interruption position.

4,000,604

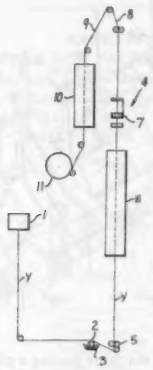
TEXTURIZED ACETATE YARN AND METHOD OF MANUFACTURE

Sung In Lee, 256-30, Seonsan, Seodaemoon, Seoul, South Korea

Filed Mar. 19, 1974, Ser. No. 452,705

Int. Cl.² D02G *3/02, 3/36*

U.S. Cl. 57—153 **8 Claims**



7. A bulky elastic texturized acetate yarn having good elasticity, good tensile strength and good durability of elasticity and tensile strength in wasing washing dry cleaning which comprises a yarn composed of acetate filaments, said filaments being in substantially twisted orientation along their length whereby said filaments have different surface textures along their lengths formed by bends, loops, folds, spirals and the like deorientations about the longitudinal axis of said filaments, said twisted orientation of said filaments being an imparted and set false twist, said false twist being imparted and set by wet heat set in the presence of coning oil twist wet heat set agent, and a cured crosslinked synthetic resin integral with said filaments, said cured crosslinked synthetic resin being from the group of a melamine, urea, ethylene vinyl acetate, vinyl acetate and acrylic resin.

4,000,605

METHOD FOR PRODUCING A CRIMPED YARN

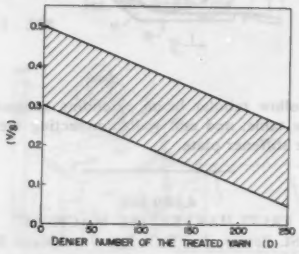
Kazuya Chimura; Takashi Kaneko; Ryuichi Nakazono; Kenichi Sakunaga, all of Ohtake, and Eiji Umemura, Nishinomiya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Osaka, Japan

Filed Sept. 19, 1972, Ser. No. 290,318

Claims priority, application Japan, Sept. 20, 1971, 46-73113; July 19, 1972, 47-72377

Int. Cl.² D02G *1/02*

U.S. Cl. 57—157 TS **1 Claim**



1. Method for producing a crimped yarn in which thermoplastic synthetic undrawn polyester yarn having birefringence of at least 15×10^{-3} is passed at a speed exceeding 300 m/min. through a twisting tube having a twisting friction surface of wear-resistant material of high frictional coefficient to apply false twisting to the yarn simultaneously with drawing at an underfeed ratio less than 200 per cent, characterized by the fact that the false twisting is performed under the condition meeting the requirements of the following equations;

$$(300-D)/10^3 \leqq V/S \leqq (500-D)/10^3 \quad (I)$$

$$T_2/T_1 \leqq 2 \quad (II)$$

where:

V= yarn speed in m/min. at the friction twisting surface;

S= surface speed in m/min. at the center of the yarn engaging portion of the friction twisting surface;

D= denier of the treated yarn;

T_1= tension of yarn is grams at the inlet side of the twisting tube; and,

T_2= tension of yarn is grams at the outlet side of the twisting tube.

4,000,606

CHAIN MAKING APPARATUS

Sven-Erik Lindén, Laxa, and Nils Gunnar Krister Forsberg, Ornskoldsvik, both of Sweden, assignors to Elektriska Svetsningsaktiebolaget, Gothenburg, Sweden

Filed Feb. 9, 1976, Ser. No. 656,628

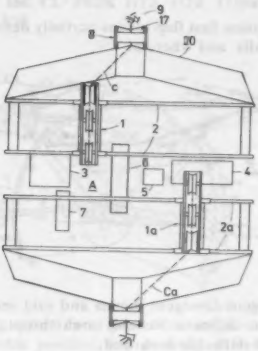
Claims priority, application Sweden, Feb. 10, 1975, 7501415

Int. Cl.² B21L *7/00*

U.S. Cl. 59—16 **4 Claims**

1. In a plant for the manufacture of two chains at a time comprising a pair of substantially parallel straight tracks at either side of a course, a first carriage running on one of said tracks for moving a depending end portion of one chain previously formed along said course to be presented successively to a plurality of operating stations provided in said course for performing a succession of operations including inserting a heated piece of bar into the lowest link of said depending portion and bending said piece of bar to form a link, flash butt welding the joint of said link and trimming the joint to remove the welding burr or bulge, and a second carriage running on the other track for moving a depending end portion of the other chain along said course to be presented to said operating

stations, and motor-driven conveyor means supported by each of said carriages for advancing the chain outwards in the transverse direction from said course, said conveyor means including a delivery member from which the chain is paid out, the improvement comprising, for each of the tracks, a stationary supporting structure arranged outside of the middle por-



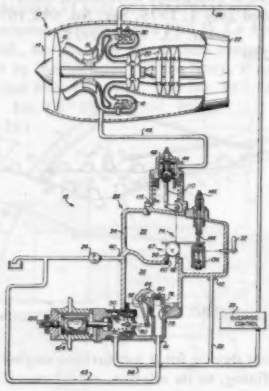
tion of the track, said structure including a chain supporting member arranged at such a height and such a transverse distance with respect to said delivery member as to allow a sagging portion of the chain supported at one end by said delivery member and at the other end by said chain supporting member to turn freely about said supporting member during displacement of the carriage along its track.

4,000,607

FLUID CONTROL VALVE AND METHOD

Frederic E. Bolliger, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 7, 1975, Ser. No. 629,737
Int. Cl.² F02C *9/10, 9/08*
U.S. Cl. 60—39.03 **15 Claims**



3. A method of controlling fluid flow from a source of pressurized fluid to a fluid outlet port, comprising the steps of:

directing fluid flow from said source through a first pair of opposed metering openings to said outlet port;

adjustably covering and uncovering said first metering openings while providing balanced flow therethrough;

directing flow from said source through a second pair of opposed metering openings to an exhaust port in parallel flow arrangement to said flow through said first metering openings;

sensing the fluid pressure differential across said first metering openings; and

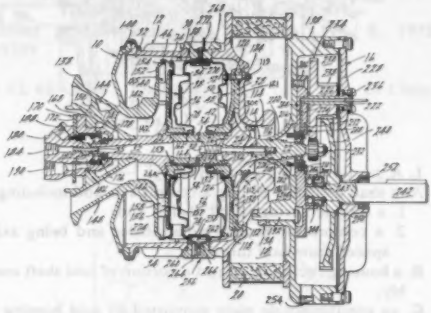
automatically adjustably covering and uncovering the second metering openings in response to the magnitude of said sensed fluid pressure differential to control fluid flow from said source to said exhaust port in a manner maintaining a substantially constant pressure differential across said first metering openings, while providing balanced flow through said second metering openings.

4,000,608

GAS TURBINE ENGINE COMBUSTION CHAMBER

Richard Chute, Huntington Woods, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 214,703, Jan. 3, 1972. This application June 24, 1974, Ser. No. 482,809
Int. Cl.² F02C *3/08*
U.S. Cl. 60—39.36 **8 Claims**



1. A gas turbine engine comprising:

A. a shaft assembly having a central axis and including

1. a turbine rotor having radial blades, and

2. a compressor rotor having radial blades, said rotors being axially spaced from one another;

B. a housing assembly enclosing at least a portion of said shaft assembly and including

1. a unitary annular intake housing having an annular axial extending portion terminating at an end and a radially extending portion having a section conforming to and enclosing a portion of said blades of said compressor rotor and defining an inlet to said compressor rotor, and

2. a unitary annular exhaust housing having an end in abutting engagement with said end of said axially extending portion of said intake housing and having a radially extending portion having a section conforming to and enclosing a portion of said blades of said turbine rotor and defining an outlet from said turbine rotor;

C. an annular liner defining a combustion chamber located between and in fluid communication with said compressor rotor, said liner being spaced from said turbine rotor and defining together with said turbine rotor an annular air space, said liner further defining an annular axially extending outlet passage in fluid communication with said combustion chamber and said turbine rotor; and

D. a plurality of circumferentially spaced radially extending tubes traversing said outlet passage from said combustion chamber, each of said tubes having a passage in fluid communication with said compressor rotor and with said annular air space between said liner and said turbine rotor, said tubes being slip fit within openings within said liner and having radially outwardly extending tabs adapted to contact one of said housings and axially extending lips adapted to contact said liner to retain said

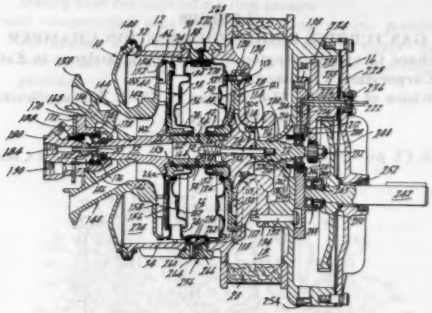
tubes relative to said outlet passage from said combustion chamber.

4,000,609

RADIAL FLOW GAS TURBINE ENGINE WITH ANNULAR COMBUSTOR LINER

Richard Chute, Huntington Woods, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 214,703, Jan. 3, 1972. This application June 24, 1974, Ser. No. 482,808
Int. Cl.² F02C 3/08, 7/06, 7/22
U.S. Cl. 60—39.36 2 Claims



1. A gas turbine engine comprising:

A. a shaft assembly having a central axis and including
   1. a turbine having radial blades, and
   2. a compressor having radial blades and being axially spaced from said turbine;

B. a housing enclosing at least a portion of said shaft assembly;

C. an annular nozzle plate supported by said housing and encircling said shaft assembly intermediate said turbine and said compressor, said nozzle plate having
   1. an annular one piece radially extending nozzle portion having cantilever vanes at least partially defining a plurality of radially extending nozzle passages in fluid communication with said turbine, and
   2. an annular axially extending hub portion projecting axially away from said turbine toward said compressor in juxtaposition to said shaft assembly; and

D. an annular liner defining a combustion chamber located between said compressor and said nozzle plate in fluid communication with said compressor and said nozzle passages, said liner including
   1. an annular radially extending portion spaced from said radially extending nozzle portion and defining therewith an annular radially extending space, and
   2. an annular axially extending portion generally encircling said hub portion and defining therewith an annular space in fluid communication with said radially extending space, said axially extending portion projecting axially away from said turbine toward said compressor and into contact wih said hub portion.

4,000,610

FLIGHT MANEUVERABLE NOZZLE FOR GAS TURBINE ENGINES

Dudley O. Nash, Forest Park; Robert G. Beavers, Mason; Joseph C. Burge, Cincinnati; Onofre T. M. Castells, Sharonville, and Alan I. Parker, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 28, 1975, Ser. No. 572,340
Int. Cl.² F02K 1/12, 1/20
U.S. Cl. 60—230 13 Claims

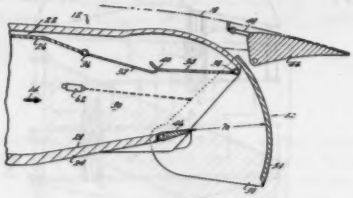
1. A flight maneuverable exhaust device for a gas turbine engine including:

a plurality of substantially opposed walls partially defining an exhaust stream flow path;

variable position convergent-divergent means partially defining a first of said walls;

deflector means positionable between a stowed position external to said exhaust stream flow path and a deployed position further defining said exhaust stream flow path; and

variable position first flap means partially defining a second of said walls, and wherein:



said convergent-divergent means and said second wall cooperate to define a variable area throat therebetween when said deflector is stowed;

said convergent-divergent means and said first flap means provide variable exhaust stream expansion control downstream of the throat when said deflector is stowed; and

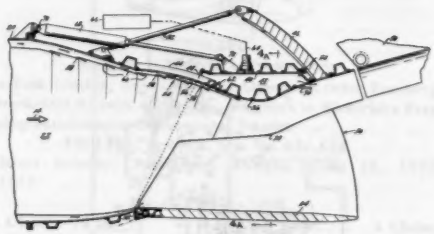
said first flap means cooperates with said deflector means to provide the variable area throat therebetween when said deflector means is in said deployed position.

4,000,611

VARIABLE AREA, LOAD BALANCING NOZZLE

Arthur McCardle, Jr., Greenhills; John J. Wright, Monroe, both of Ohio, and Jarod L. Baugh, Waco, Tex., assignors to General Electric Company, Cincinnati, Ohio

Filed July 1, 1975, Ser. No. 592,107
Int. Cl.² F02K 1/12
U.S. Cl. 60—230 24 Claims



1. An exhaust device for a gas turbine engine comprising:

a casing defining, to its interior, an exhaust fluid flow path and, partially defining, to its exterior, pressure plenum means;

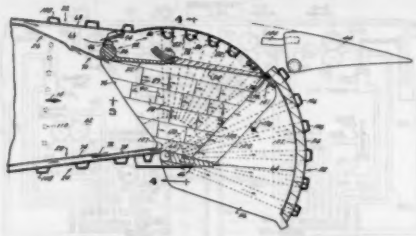
a variable position flap spaced from said casing to define said exhaust fluid flow path therebetween to control flow path area; and

piston means operatively connected to the flap, said piston means partially defining the plenum means and exterior to the flow path; wherein said plenum means and said piston means comprise a first actuation means to at least partially balance exhaust pressure loads on the flap.

4,000,612
COOLING SYSTEM FOR A THRUST VECTORING GAS TURBINE ENGINE EXHAUST SYSTEM

Thomas G. Wakeman, West Chester, and Dudley O. Nash, Forest Park, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed July 28, 1975, Ser. No. 599,644
Int. Cl.² F02K *1/12, 1/20, 11/04*
U.S. Cl. 60—230 **16 Claims**



1. A cooling system for a gas turbine engine exhaust nozzle having a variable position flap partially defining an exhaust stream flow path, a fixed wall further defining the flow path, and actuating means for positioning the flap, the cooling system comprising:

a plenum partially defined by the flap and external to the flow path;

first passage means for introducing cooling fluid into said plenum;

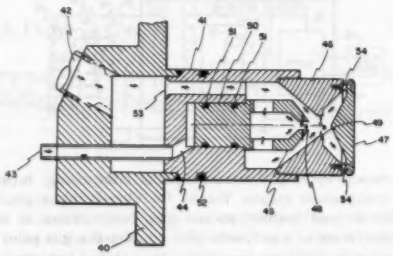
means for exhausting the cooling fluid from said plenum; and

first means connected to the actuating means for regulating the cooling fluid pressure level entering said plenum, wherein the first regulating means comprises a first valve which is held closed by the pressure of the cooling fluid when the actuating means is in a first operative position, and means to override the cooling fluid pressure and open the first valve when the actuating means is in a second operative position.

4,000,613
DUAL MODE FLUID MANAGEMENT SYSTEM

Akiharu Fukumoto, Milpitas, and Phil D. La Force, San Jose, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1975, Ser. No. 550,103
Int. Cl.² F02K *9/06;* **B05B** *7/12*
U.S. Cl. 60—251 **3 Claims**



1. A dual orifice injector assembly for use in a hybrid rocket motor having a boost and sustain mode comprising;

said assembly having an inlet housing and manifold housing;

said manifold housing having an inner bore;

a sustain injector poppet slideably mounted within said bore;

a sustain injector orifice at one end of said poppet;

a boost injector seat mounted on one end of said manifold housing;

a boost injector orifice contained in said seat;

an inlet manifold in said inlet housing in open communication with said sustain injector and boost injector in the boost mode of said rocket motor;

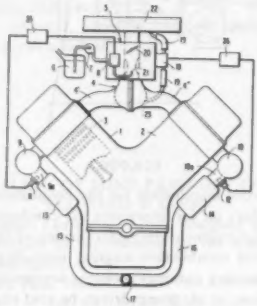
actuating means acting on said poppet to cause the poppet to seat against said boost injector seat in the sustain mode of said rocket motor; and

flow deflector means in flow communication with said boost injector and sustain injector to cause fluid from said injectors to be dispersed in a fan like pattern at substantially right angles to the axis of said manifold housing.

4,000,614
MIXTURE COMPRESSING INTERNAL COMBUSTION ENGINE WITH TWO CYLINDER ROWS AND EXHAUST GAS TREATMENT

Jörg Abthoff, Pluderhausen, and Dag-Harald Hüttebräucker, Endersbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 23, 1976, Ser. No. 651,817
Claims priority, application Germany, Feb. 8, 1975, 2505339
Int. Cl.² F01N *3/15;* **F02B** *75/10*
U.S. Cl. 60—276 **16 Claims**



1. A mixture-producing reciprocating-piston internal combustion engine which comprises at least two cylinder rows each having at least one working cylinder means, a mixture-producing means common to both cylinder rows having a controllable fuel supply means and operatively connected with the working cylinder means of the two rows by way of suction channel means, exhaust gas catalyst means for the after-burning of the exhaust gases arranged in exhaust gas line means of the engine, and a separate exhaust gas manifold means for each cylinder row, characterized in that an oxygen probe means is arranged in the exhaust gas manifold means of each cylinder row and is operable to produce an electrical signal dependent in its magnitude from the value of the air/fuel ratio, one of the oxygen probe means being at least indirectly operatively connected with the controllable fuel supply means of the mixture-producing means in such a manner that the air/fuel ratio supplied to one cylinder row is maintained substantially constant within given limits, and in that the other oxygen probe means is operatively connected at least indirectly with a controllable additional air supply means which is arranged in a by-pass line means conducting additional air and terminating downstream of the mixture-producing means in the corresponding part of the suction channel means, the operative connection of said other oxygen probe means with the additional air supply means being such that the air/fuel mixture conducted to the other cylinder row belonging to said other oxygen probe means is also held substantially constant within the given tolerances.

4,000,615

CONTROL INSTALLATION FOR THE PROPORTIONING OF A SECONDARY AIR QUANTITY FOR IMPROVEMENT OF THE COMBUSTION IN INTERNAL COMBUSTION ENGINES OR THE AFTERBURNING OF THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

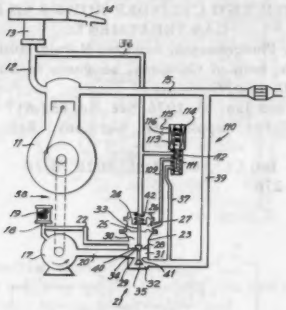
Wilfried Bockelmann, Buttgen; Hans Grözinger, Neuss, and Peter Ulrich Wöbky, Nievenheim, all of Germany, assignors to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft, Neuss, Germany

Filed Jan. 22, 1975, Ser. No. 543,052

Claims priority, application Germany, Jan. 23, 1974, 2401313

Int. Cl.² F01N 3/10; F02B 75/10

U.S. Cl. 60—277 3 Claims



1. In a control installation for the proportioning of a quantity of secondary air for improving the combustion in an internal combustion engine or the afterburning of the exhaust gases of the internal combustion engine, including a plurality of external measuring parameters being transmitted to said control installation; an air pump driven by said engine adapted to dose the air quantity flowing into said control installation dependent upon the rotational speed of said engine forming a measuring parameter; and an arrangement operatively connected with said control installation for withdrawing and reconveying a portion of the air flowing into said control installation dependent upon at least one of the measuring parameters, the improvement comprising: an auxiliary arrangement associated with said control arrangement for the instantaneous shutting-off of the flow of said secondary air responsive to a generated emergency signal; conduit means for conveying said secondary air flow, said auxiliary arrangement comprising a reversing valve located in the flow path of said conduit means adapted to permit free air flow therethrough during undisturbed operation and, upon receipt of a generated emergency signal, to instantaneously divert the flow of air to atmosphere or back to said air pump; said reversing valve being pneumatically actuated through an actuating conduit thereof; and a smaller-proportioned electromagnetically-actuated valve being located in the flow path of said actuating conduit and being responsive to said emergency signal; said pneumatically actuated reversing valve being an integral element of said control installation, said installation including a control pressure chamber, said electromagnetically-actuated valve connecting said control pressure chamber with the exhaust gas manifold of said engine through a conduit during the undisturbed operation of said engine and, in response to an emergency signal during disrupted operation, with a conduit connected to the suction side of the engine.

4,000,616

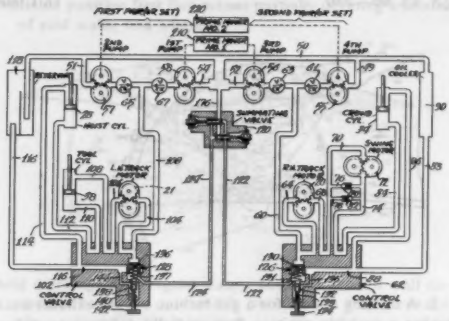
MULTI-ENGINE MULTI-PUMP HYDRAULIC SUMMATING SYSTEM

William D. Symmank, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 15, 1976, Ser. No. 666,897

Int. Cl.² F15B 13/09

U.S. Cl. 60—420 10 Claims



1. A plurality of prime movers each of which is connected to a group of interconnected fixed displacement pumps to drive same in cooperation with a summating system for controlling the fluid under pressure in a plurality of hydraulic systems, each of said hydraulic systems being supplied by a set of pumps connected in parallel, each set comprising at least one pump of each said driven group, and including a relief valve for each of said set of pumps, which valves are responsible to the fluid under pressure emanating from all of said sets of pumps, said valves controlling the flow of fluid between the outlet and inlet of said sets of pumps to relieve the pressure in the systems when the summated outlet pressures of said sets of pumps exceed the maximum allowable pressure.

4,000,617

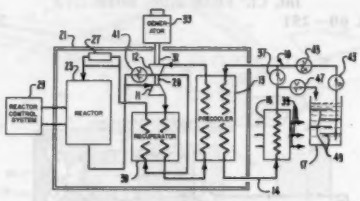
CLOSED CYCLE GAS TURBINE SYSTEM

Peter Fortescue, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jan. 27, 1975, Ser. No. 544,130

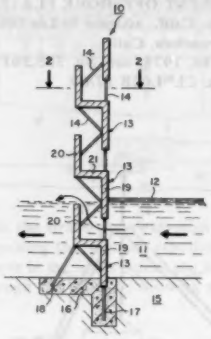
Int. Cl.² F01K 25/10; F02C 7/12, 9/00

U.S. Cl. 60—644 10 Claims



1. A closed cycle gas turbine system comprising, turbine means, compressor means, means for circulating a gas for expansion in said turbine means and compression in said compressor means, a precooler for cooling the gas prior to compression in said compressor means, a closed loop coolant circuit for circulating a coolant through said precooler, said coolant circuit including a heat exchanger for cooling the coolant therein, a storage tank for storing a supply of coolant at a temperature substantially lower than the temperature of coolant in said coolant circuit at the discharge side of said heat exchanger, and means for selectively circulating the coolant in said storage tank through said precooler to provide a power increase in said gas turbine system.

4,000,618
SKIMMER FENCE
Leland F. Stovall, Corpus Christi, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Apr. 28, 1975, Ser. No. 572,556
Int. Cl.² E02B 3/00
U.S. Cl. 61—1 F 3 Claims



1. Apparatus for removing a layer of oil floating on a substantially level unidirectional flowing stream of water from said stream comprising:

a plurality of water impervious baffles connected together in a vertical arrangement; each baffle overlapping in a vertical plane a selected portion of an adjacent baffle to form a plurality of flow passageways between each baffle, each passageway defining a selected overflow space across the length of said baffle, and each baffle extending completely across said stream and comprising two parallel spaced apart vertically extending baffle members connected together by a horizontally extending baffle member perpendicular thereto.

4,000,619
MEANS AND METHOD FOR CONTROLLING BEACH AND SANDBAR EROSION
Charles T. Ziegler, 9842 13th St., Santa Ana, Calif. 92703
Filed Mar. 19, 1976, Ser. No. 668,619
Int. Cl.² E02B 3/04
U.S. Cl. 61—3 6 Claims

1. A means for controlling a sandbar erosion comprising:

a. a feeder line;

b. means for anchoring one end thereof underneath a wave area, the line extending therefrom to an adjacent shore area;

c. means for movably securing the other end thereof to a structure on the adjacent shore;

d. a plurality of porous bags secured to said feeder line each having an open end for receiving sand;

e. the feeder line and bags being progressively movable by wave action into the wave area, the bags progressively receiving moving sand present in the wave area causing the bags to settle to the bottom of the wave area, and resist erosion.

4,000,620
GRAVITATIONAL IRRIGATION SYSTEM AND METHOD OF INSTALLING
Merle M. Burge, Box 1123, Kittitas, Wash. 98934
Filed Nov. 6, 1974, Ser. No. 521,294
Int. Cl.² E02B 13/00
U.S. Cl. 61—12 5 Claims

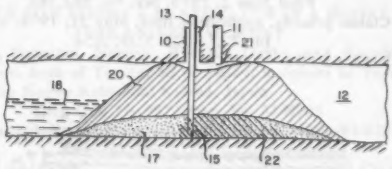
1. A gravity-flow irrigation system for irrigating a field of arbitrarily spaced furrows, comprising:

water-impervious, flexible, preformed tubing extending along the ground at arbitrary angles with respect to said furrows adjacent the area to be irrigated, one end of the tubing being secured to a source of water and the other end being restricted to control exit of water,

a plurality of longitudinally spaced apertures cut in the tubing after the tubing has been laid along the ground, each of said aperatures being positioned adjacent one of said furrows, and

open-ended, annular, laterally disposed outlet spigots in each of the cut apertures.

4,000,621
REMOTE SEALING OF MINE PASSAGES CONTAINING FLOWING WATER
Kenneth R. Maser, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed June 19, 1975, Ser. No. 588,549
Int. Cl.² E02D 3/12
U.S. Cl. 61—35 10 Claims



1. A remote method for constructing a seal in an underground passage through which water is flowing which comprises:

drilling at least one borehole, but no more than two boreholes, from the surface to intersect the passage;

distributing a layer of relatively coarse aggregate over the floor of the passage to a depth sufficient to allow percolation of the flowing water through the aggregate layer without water flow over the top of said layer;

pneumatically injecting a particulate material consisting essentially of fly ash, fly ash admixed with a swelling clay or fly ash admixed with cement down the borehole until said passage is completely filled with the particulate material along a substantial length thereof to form a water impervious plug atop the aggregate layer, and

injecting a cementitious grout into said aggregate layer to seal off water flow through the aggregate.

4,000,622

SHORING STRUCTURE FOR EMBANKMENTS

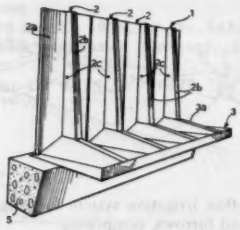
Carlo Chiaves, Piazza Adriano, 6 Turin, Italy

Filed May 14, 1975, Ser. No. 577,369

Claims priority, application Italy, May 20, 1974, 68577/74

Int. Cl.² E02D *5/20*; **E04B** *1/344*

U.S. Cl. 61—39 **2 Claims**



1. A shoring structure for embankments, of the type comprising a number of substantially vertical prefabricated panels of reinforced concrete arranged side-by-side so as to form a shoring wall, each panel having on its surface which faces the material to be supported, at least one stiffening rib extending substantially from the bottom to the top of each panel, a foundation for said panels, said foundation being cast on site, and a bed of cast reinforced concrete which encloses the lower ends of the panels and anchors the latter to said foundation, said bed being eventually covered by the supported material, wherein the improvement consists in the lower end of each stiffening rib of each prefabricated panel being delimited by an inclined face extending for the whole width of the rib, starting from the bottom of the panel, which inclined face when in place faces the material to be supported; said inclined face forming, in the shoring structure, an angle to the horizontal between 25° and 60°, and reinforcing elements connecting the bed to the respective stiffening rib passing through said inclined face in a direction perpendicular thereto.

4,000,623

ANCHOR ROD FOR WALLS, BULKHEADS AND THE LIKE

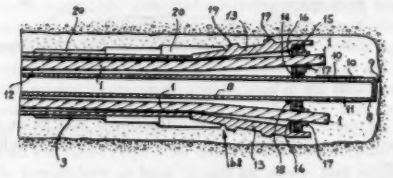
Pietro Meardi, Via Battistotti Sassi, 29, 20133 Milan, Italy

Filed June 2, 1975, Ser. No. 582,785

Claims priority, application Italy, May 31, 1974, 23420/74

Int. Cl.² E02D *5/38*, *5/54*

U.S. Cl. 61—39 **9 Claims**



1. An anchor rod for supporting walls, bulkheads, and the like, and adapted to extend into an elongated hole in the ground and to be anchored in said hole, said rod comprising a central pipe that extends into the hole for feeding cement into the hole, a plurality of cables extending lengthwise of the hole and surrounding said central pipe, a pair of telescoping pipes surrounding said cables, one of said telescoping pipes being disposed adjacent the inner end of the hole and the other adjacent the outer end of the hole, an inflatable plugging sleeve on said other pipe, the ends of said cables within said hole being secured to said one telescoping pipe, said one telescoping pipe carrying a frustoconical element whose small end points in a direction out of the hole, and a headpiece fixed to the wall or the like to be supported, the other ends of said cables being connected to the headpiece for tightening the cables to draw said frusto-conical element in a direction out of the hole thereby to compress cement between said frusto-conical element and the inflatable sleeve.

4,000,624

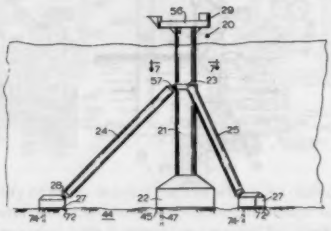
MULTI-COMPONENT OFFSHORE PLATFORM

Philip Y. Chow, Orinda, Calif., assignor to Lin Offshore Engineering, Inc., San Francisco, Calif.

Filed June 10, 1975, Ser. No. 585,501

Int. Cl.² L02B *17/00*

U.S. Cl. 61—88 **15 Claims**



1. A multi-component offshore platform, including in combination:

an inherently self-floatable central column having an enlarged base adapted to rest on the bottom of the sea and having ballast chambers with water inlet means, some of said chambers being close to said base and others distant therefrom, said central column being towed to its site while floating generally horizontally and then upended by ballasting said chambers that are close to said base and then further ballasted by filling chambers distant from said base to sink its base to a final resting site on the bottom of the sea,

a hitch collar slidably arranged around said central column with means for securing it immovably to said column at a desired location on said column, well above said base and well below the top of said column,

at least three inclined legs that are each separately self-floatable for towing to the site and ballastable for sinking, each said leg having a foot member hinged to one extremity thereof, for resting on the bottom of the sea, each said leg being detachably hingedly connected at its other extremity to said hitch collar, and

superstructure secured atop said column and supported solely by said column, said column, in turn, being partly supported to said legs wherein said hitch collar has a plurality of extensions, one for each said leg, each having guide channel means extending upwardly at an angle to said central column, and wherein said hinged connection includes a hinge block slideably mounted in each said guide channel with hinge means rotatably attached thereto and secured to said leg.

4,000,625

METHOD OF COOLING A MOVING STRAND OF HOT MATERIAL

Hugo Beerens, Meerbusch; Hugo Feldmann, Hoengen, and Claus Georg Schlanzke, Ratingen-Tiefenbroich, all of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Dec. 3, 1974, Ser. No. 529,233

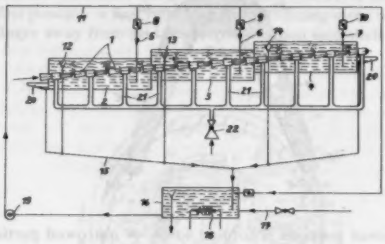
Claims priority, application Germany, Dec. 7, 1973, 2361042

Int. Cl.² F25D *13/06*

U.S. Cl. 62—63 **5 Claims**

1. In a method of cooling a moving strand of hot material,

comprising the steps of: passing the strand through a plurality of aligned cooling tubes in at least one container containing water in which the tubes are immersed; and water-cooling the



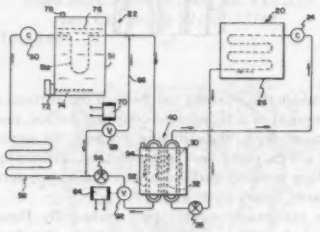
strand while the strand passes through the tubes, the improvement comprising the step of: expelling at least a part of the water present in the tubes before the leading end of the strand passes through the tubes by blowing air into the tubes.

4,000,626

LIQUID CONVECTION FLUID HEAT EXCHANGER FOR REFRIGERATION CIRCUIT

Robert C. Webber, 13 Bay Colony Lane, Ft. Lauderdale, Fla. 33308

Filed Feb. 27, 1975, Ser. No. 553,559
Int. Cl.² F25B *7/00, 41/00*
U.S. Cl. 62—175 **10 Claims**



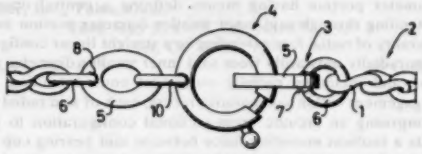
1. In a phase-change refrigeration circuit including a compressor, condenser and evaporator and connecting conduit means charged with a phase-change refrigerant, each of said compressor, condenser and evaporator having an output and input, the improvement comprising a heat exchanger, said heat exchanger including container means filled with a liquid convection fluid, said container means enclosing a portion of said circuit such that said convection fluid is in heat-conducting relation to the system refigerant flowing through said portion, said container means being disposed between the compressor output and condenser input to enclose a portion of the conduit means extending therebetween, and additional conduit means providing a connection between the condenser output and compressor input to by-pass said evaporator, a portion of said additional conduit means being enclosed by said container means to have the refrigerant flowing therethrough in heat-conducting relation to said convection fluid, and valve means for controlling the flow of refrigerant through said conduit means and said additional conduit means.

4,000,627

PENDANT JEWEL CHAIN

Hans Gustav Erik Wahlbeck, Nybble, 150 32, Stallarholmen, Sweden

Filed Nov. 11, 1974, Ser. No. 522,876
Claims priority, application Sweden, Nov. 16, 1973, 7315541; Jan. 24, 1974, 7400918
Int. Cl.² A44C *25/00*
U.S. Cl. 63—2 **2 Claims**



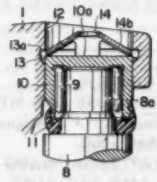
1. A pendant jewel chain comprising a link chain part, a connection means mounted thereto at at least one end thereof; and an openable clasp means for providing opening and closure of said pendant jewel chain, characterized in that said connection means is composed of two parts and comprises a first, relatively large control mark loop part connected to the clasp means and a second, connection ring part which forms a unit with the control mark loop part and which is small enough to be connected to the outermost chain link, one end of said connection ring part being rigidly connected to said control mark loop part and another end of said connection ring part being separate from said control mark loop part but in proximate relationship thereto so as to complete the connection ring part through an open connection which permits deflection of said another end of said connection ring part when the forces in tension on said chain part exceed the level which is less than the critical forces required to break the chain part to thereby provide release of said chain part from said connection means, said control loop part including parallel planar side surfaces, one end of said connection ring part projecting from one of said planar side surfaces of said control mark loop part and the opposite end of said connection ring part being disposed adjacent to the opposite planar surface of said control mark loop part.

4,000,628

DEVICE FOR FIXING A BEARING CUP IN A HOOKE'S TYPE UNIVERSAL JOINT

Kiyoshi Funatani, Nagoya; Ryosuke Ozaki, and Kazuhiro Mizuno, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

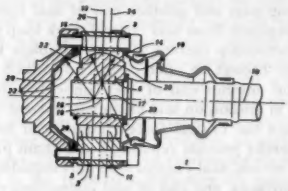
Filed Oct. 15, 1974, Ser. No. 514,908
Claims priority, application Japan, June 5, 1974, 49-62811
Int. Cl.² F16D *3/26*
U.S. Cl. 64—17 A **2 Claims**



1. A universal joint assembly comprising, in combination, a pair of pivotally interconnected bifurcated yoke members, joint means including a cruciform spider and needle bearings operatively engaged thereabout interconnecting said yoke members, a bearing cup including a closed end wall enclosing said spider and needle bearings, wall means in one of said yoke

members defining a receiving hole therein for enabling insertion into said joint means of said bearing cup, an annular recess formed in said wall means adjacent said closed end wall of said bearing cup, and a fixing plate extending across said closed end wall and engaged within said recess means to hold said bearing cup in place within said assembly, said fixing plate consisting essentially of a resilient member shaped to enable said member to be deformed with a spring-like snap action between a truncated conical configuration and a flat planar configuration, said fixing plate comprising an inner smaller diameter portion having means defining a central opening extending through said inner smaller diameter portion and a plurality of radial legs extending in a straight linear configuration radially outwardly from said inner smaller diameter portion and including radially outermost ends extending into engagement within said annular recess, each of said radial legs comprising an arcuate cross-sectional configuration to provide a resilient mounting force between said bearing cup and said yoke member when said radially outermost ends of said arcuate radial legs are engaged within said annular recess to hold said bearing cup in place.

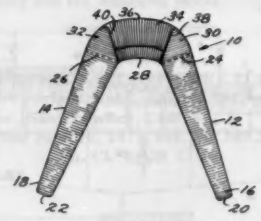
4,000,629
HOMOKINETIC JOINT
Andrea Bellomo, Str. S.Anna 82/6, Torino, Italy 10131
Filed July 11, 1975, Ser. No. 595,012
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **5 Claims**



1. A homokinetic universal joint comprising an inner element, an outer element and an even number of driving balls, each ball being engaged and guided solely by two opposite grooves symmetrically crossing on the bisector plane of the angle between the axes of the shafts connected by the joint, one groove formed on the inner element and the other groove on the outer element, characterized by the fact that portions of two spherical surfaces (14, 15) are formed on the ends of the inner element with their spherical centers (16, 17) on the axis of the inner element, each spaced towards the opposite spherical surface, and two cups are connected to the ends of the outer element, portions of two spherical surfaces (19, 20) being formed on the said cups with their spherical centers (17, 16) on the axis of the outer element, each spaced towards the respective cup, the axial relative sliding of the two elements being limited by the contact and the mating of the said spherical surfaces formed on the inner element with the said spherical surfaces formed on the cups connected to the outer element.

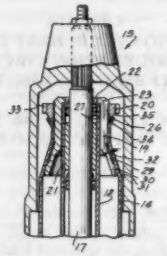
4,000,630
SEAMLESS PANTY HOSE AND METHOD
Walter H. Imboden, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed May 22, 1973, Ser. No. 362,923
Int. Cl.² A41B *9/00, 11/00*
U.S. Cl. 66—177 **10 Claims**

1. In a seamless lower body garment comprising a pair of seamless tubular legs and a rotary knitted tubular body portion knit so as to extend between said legs and defining a crotch area therebetween, said body portion including a walewise slit along at least a portion thereof so as to define a waist opening opposite said crotch area, the improvement comprising reciprocatorily knitted fashioned portions between each of said two leg portions and said body portion, wherein one of



said fashioned portions is formed solely of narrowed partial courses and the other of said fashioned portions is formed solely of widened partial courses.

4,000,631
RECEPTACLE DRIVE COUPLING FOR AN AUTOMATIC WASHER
Reinhold Alvin Drews, and Frank Robert Burgener, Jr., both of Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 30, 1975, Ser. No. 545,261
Int. Cl.² D06F *23/04*
U.S. Cl. 68—23.7 **8 Claims**



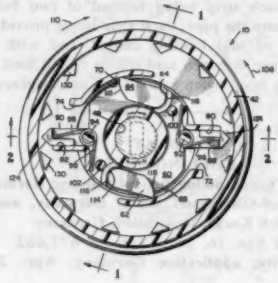
2. In an automatic washing machine of the vertical axis type, the improvement of a receptacle coupling device, comprising:
- a cylindrical drive body having an axis, an upper part, a flared lower part, and a projecting, circumferentially-extending contact surface about the outer periphery of said flared lower part, and
- a hollow receptacle center post outwardly flared downwardly below its top to correspond to the flare of said lower part of said drive body,

to facilitate accurate alignment of the receptacle center post with respect to said axis of said drive body.

4,000,632
LOCKING GAS CAP
Dennis J. Summan, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.
Filed Aug. 4, 1975, Ser. No. 601,264
Int. Cl.² B65D *55/14*
U.S. Cl. 70—165 **8 Claims**

1. A threaded cap for a threaded filler neck, said cap comprising a closure member threaded to engage and close said filler neck and an outer shell member mounted on said closure member to provide a hand grip, in which the improvement comprises means for connecting said outer shell member for rotation on said closure member, and means for establishing a driving connection between said members, said driving con-

nection means including a plurality of peripherally spaced apart abutments rigidly attached to one of said members and at least one drive finger attached to the other of said members for movement between a first position which engages said abutments and a second position out of engagement with said abutments, means for yieldably urging said drive finger to said first position, a first rigid stop for preventing movement of said finger away from said first position when said shell member is



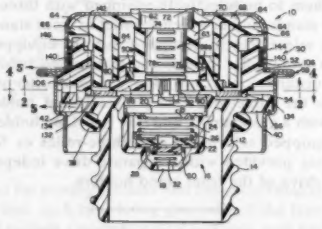
rotated in one direction to advance said closure member onto the filler neck, said rigid stop being stationary with respect to said shell member, second stop means including a stop cam movable into an operative position for preventing movement of said finger away from said first position when said shell member is rotated in the opposite direction, and lock means for moving said second stop means to said operative position to permit removal of said cap, said lock means being operatively connected to said second stop means.

4,000,633

LOCKING GAS CAP WITH TORQUE OVERRIDE FEATURE

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Sept. 8, 1975, Ser. No. 611,219
Int. Cl.² B65D *51/16, 55/14*
U.S. Cl. 70—165 **17 Claims**



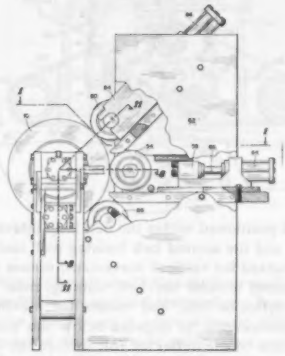
1. A locking gas cap for a threaded filler neck having an axis and a sealing lip extending peripherally about said axis, said cap comprising a closure member threaded to engage and close said filler neck, gasket means on said closure member for engaging and sealing against said lip, an outer shell providing a hand grip secured to said closure member for rotation thereon about said axis, a key-operated lock and at least one locking member moved by said lock, said lock and locking member being connected to said shell for rotation therewith, in which the improvement comprises a race disposed for rotation in said shell, means for drivingly connecting said race and said closure member for rotation together about said axis, said connecting means being torque limited in the direction which advances said closure member on said filler neck to protect said gasket means against overtightening and positive in the opposite direction to permit removal of said cap from said filler neck, said locking member being movable into and out of engagement with said race selectively to provide a driving connection between said shell and said race.

4,000,634

METHOD AND APPARATUS FOR FORMING A SHEAVE FROM A FLAT DISC OF METAL

Claude M. Hixson, Tulsa, Okla., assignor to Don R. Hinderliter, Inc., Tulsa, Okla.

Filed May 5, 1975, Ser. No. 574,592
Int. Cl.² B21H *1/04*
U.S. Cl. 72—69 **10 Claims**



1. Apparatus for forming a flat circular disc of metal into a sheave having an annular peripheral groove for receiving a wire line therein, the size and shape of said groove corresponding to the diameter of said wire line, said disc having two flat side portions separated by the width of said disc and having an outer diameter slightly larger than the outer diameter of the sheave to be produced; comprising a pair of rotatable holding members for engaging said disc therebetween, said rotatable holding members engaging said disc adjacent the center thereof with the periphery of said disc extending outwardly beyond said holding members, means for rotating said holders and said disc about a given horizontal axis, a rotatable forming roller rotatable on an axis substantially parallel with said given horizontal axis and movable in a direction substantially at right angles to said given horizontal axis and into contact with the outer periphery of said disc, the portion of said forming roller contacting said disc having a convex shape corresponding to the size and shape of the groove desired for the wire line and contacting said disc on the outer periphery thereof at a position substantially equidistant from the flat side portions of said disc, means for heating the flat side portions of said disc adjacent said periphery, means for urging said roller continuously against said periphery of said disc during the heating thereof until said roller forms said groove in the periphery of said disc.

4,000,635

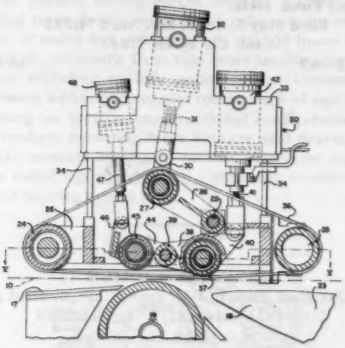
STRIP DEFLECTOR UNIT

Werner W. Eibe, McCandless Township, Allegheny County, PA, assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed Mar. 18, 1976, Ser. No. 668,059
Int. Cl.² B21C *47/04, 47/14*
U.S. Cl. 72—148 **11 Claims**

1. Apparatus for directing traveling metal strip along a pass

line with respect to a downcoiler comprising a deflector roll positioned below the pass line of the strip tangent thereto, a pair of belt training rolls positioned above the pass line and spaced therefrom, the first belt training roll being positioned in advance of the deflector roll and the second belt training roll being positioned on the exit side of the deflector roll, a belt trained around the first and second belt training rolls in a loop and having a lower flight extending between the first and second belt training rolls, means for tensioning the belt, a



persuader roll positioned within the belt loop intermediate the deflector roll and the second belt training roll, said persuader roll being mounted for vertical movement, means for causing the belt to travel around the belt training rolls, means for rotating the deflector roll, and means for moving the persuader roll downwardly to depress below the pass line and around a portion of the deflector roll surface the lower flight of the belt trained around that roll, thereby imparting a downward curl to the leading end of strip passing thereunder and over the deflector roll so as to direct it into the downcoiler.

4,000,636

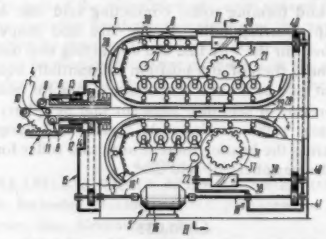
PIPE BENDING MACHINE

Vladimir Nikolaevich Shubin, Pervomaiskaya ulitsa, 1, kv. 103; Viktor Sergeevich Silantiev, Kastanaevskaya ulitsa, 57, korpus 1, kv. 58; Alexandr Sergeevich Khlyntsev, Kolenchataya ulitsa, 4a, kv. 8; Antonina Petrovna Barsova, Sheremetievskaya ulitsa, 67, korpus 2, kv. 5, and Galina Alexeevna Rodionova, 5 Parkovaya ulitsa, 40, korpus 1, kv. 65, all of Moscow, U.S.S.R.

Filed May 1, 1975, Ser. No. 573,404

Int. Cl.² B21D *7/024*

U.S. Cl. 72—173 **8 Claims**



1. A pipe bending machine comprising a bed plate; a bending head mounted on said bed plate; a mechanism for feeding pipes to be treated into said bending head, with said mechanism installed on said bed plate; a drive serving to actuate said bending head and said feeding mechanism, with said drive installed on said bed plate; two parallel rows of rollers of said feeding mechanism arranged symmetrically relative to the axis of the pipe being treated; two cages, each incorporating one of said rows of rollers, with the first said cage rigidly fixed to said bed plate and with the second said cage installed on said bed plate, allowed to turn in the plane normal to the axis of said rollers and spring-loaded in the direction toward said first cage; two closed-loop hauling chains, each embracing the rollers of one of said rows in assembly with said cage, with each said hauling chain provided on the inner side for coupling with said drive used to displace said chain toward said bending head; and two closedloop strips made of elastic friction material, each strip being formed of two belts which cooperate to clamp the pipe, each strip being provided on the outside of one of said hauling chains, and with the pipe clamped in the gap between said chains which feed said pipe into the bending head when said chains are displaced.

4,000,637

ROLLING MILLS

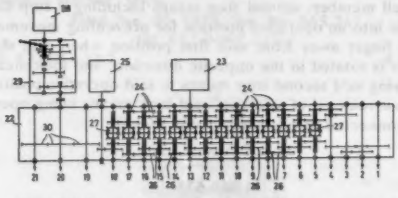
Hans-Dieter Gerhards, Solingen-Grafrath, and Hermann Möltner, Dusseldorf-Oberkassel, all of Germany, assignors to Firma Friedrich Kocks, Dusseldorf, Germany

Filed Apr. 16, 1976, Ser. No. 677,662

Claims priority, application Germany, Apr. 21, 1975, 2517536

Int. Cl.² B21B *17/00, 23/00*

U.S. Cl. 72—226 **10 Claims**



1. A stretch-reducing rolling mill for optionally producing tubes having a final circular or angular cross-sectional configuration, comprising a plurality of driven roll stands arranged in stand holders one behind the other in the rolling direction, said roll stands and holders being divided into a first and a second group in which rolling mill the second stand holders are last in the rolling directions and are spaced sufficiently apart for them to be selectively equipped with three-roller or four-roller stands, and in which the first or front stand holders cannot be selectively so equipped but are equipped exclusively with three-roller stands, said front stand holders being spaced at distances apart too close for four-roller stands but adapted to the three-roller stands, said front holders being provided with a group drive, and said last stand holders, which may be equipped selectively with three-roller or four-roller stands, being provided with a separate drive independent of the group drive of the front stand holders.

4,000,638

PLATE MILL FINISHING STAND ROLL LATCH RING

McKinley B. Thomas, Orem, Utah, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1975, Ser. No. 563,932

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

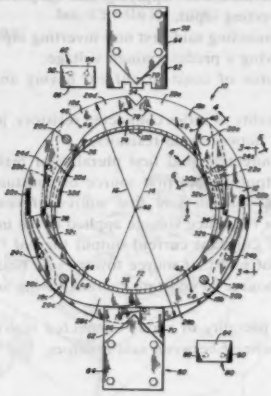
Int. Cl.² B21B *31/08*

U.S. Cl. 72—238 **9 Claims**

1. A latch ring chock retainer assembly for a roll having a circumferal groove formed therein, said latch ring assembly comprising:

a housing including means defining an aperture formed through the center thereof, said aperture having a diameter such that said housing is capable of fitting over an end of such roll;

a plurality of latching arms mounted to said housing, said latching arms being movable between a latched position, in which a portion of said latching arm engages such circumferal groove in such roll, and an unlatched position



in which said portion of said latching arm is moved out of engagement with such roll groove; and

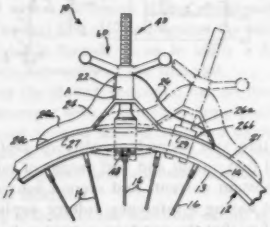
means for biasing said latching arms toward their said latched positions.

4,000,639

TOOL AND METHOD FOR TRUEING WHEEL RIMS

Leonard F. Postema, 2785 Northville Drive NE., Grand Rapids, Mich. 49505

Filed Apr. 8, 1975, Ser. No. 566,051
Int. Cl.² B21D *3/10*
U.S. Cl. 72—316 **26 Claims**



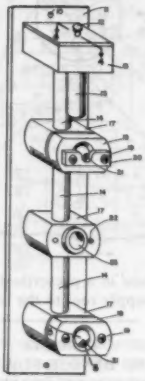
1. A tool for trueing circular and other curvilinear rims such as wheel rims, such rims being generally of the type including inside and outside circumferential surfaces, said tool comprising extending means for engaging generally the inside circumferential surface of a damaged, bent area of such a rim when said tool is mounted on such a rim; support means for supporting at least a portion of the rim adjacent the damaged, bent area of the rim, said support means including contact means for engaging a portion of generally the outer circumferential surface of at least one of a rim and any tire supported on the outer circumference of such a rim; and position changing means for moving at least a portion of at least one of said exchanging means and support means relative to the other whereby said damaged, bent area is trued with respect to the supported area of the rim; said extending means including a rim engaging portion having aperture means therethrough for receiving a spoke of a wheel rim such that said rim engaging portion will simultaneously engage the inside circumferential surface of a wheel rim on either side of the spoke.

4,000,640

TONOMETER TESTER

Donald Orrie Kocmich, Hillsborough, Calif., assignor to Opti Products Incorporated, Reno, Nev.

Filed Aug. 8, 1975, Ser. No. 603,192
Int. Cl.² G01L *25/00*
U.S. Cl. 73—1 B **1 Claim**



1. A device to provide multiple simultaneously known pressures and multiple pressurized test surfaces for the measurement of force comprising a vertical liquid filled column, a reservoir mounted on top of said column, means for providing a constant liquid level in said reservoir, multiple spaced housings, along the length of said column, each said housing having an internal cavity in fluid communication with said column and a flexible membrane lining at least a portion of said cavity, and having an exposed surface whereby said membrane, when subject to liquid pressure when within said cavity, forms a bulbous shape approximating the contour of the cornea of the human eye.

4,000,641

FRICTION MEASURING APPARATUS

William Dein Lewis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1975, Ser. No. 573,994
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² G01N *19/02*
U.S. Cl. 73—9 **5 Claims**

1. An apparatus for measuring friction between a yarn and a cylindrical surface comprising:

a frame having two arms extending outwardly at a fixed included angle from a common central location on a line bisecting the angle, said arms each having an inner surface for resting on said cylindrical surface;

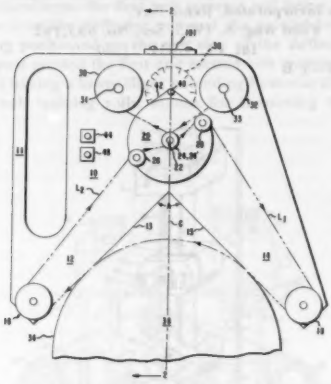
a pulley rotatably mounted at the end of each of said arms, each pulley having a peripheral surface tangent to said inner surface of its associated arm;

a disc rotatably mounted at its center on a fixed pivot on said frame at a location above said arms on said line bisecting said angle, said disc having at least one yarn pulley rotatably mounted thereon at said pivot and two other yarn pulleys mounted rotatably thereon near the periphery of said disc, said two other yarn pulleys being separated by substantially one-half the circumference of said disc;

two driven yarn supply reels mounted on said frame above said fixed pivot on opposite sides of said line bisecting said angle;

means for driving said reels; and

means for sensing the angular position of said disc with respect to said frame when yarn is passed across said



cylindrical surface in a prescribed path around said pulleys from one supply reel to the other.

4,000,642

PROCESS AND DEVICE FOR TESTING THE THERMOSTABILITY OF SHAPED ARTICLES OF THERMOPLASTIC MATERIAL

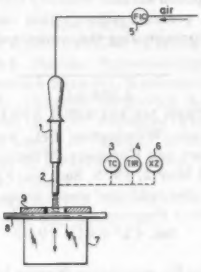
Hans Vowinkel, Florsheim, (Main), and Hans Röber, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 24, 1975, Ser. No. 598,627

Claims priority, application Germany, July 26, 1974, 2435999

Int. Cl.² G01N *25/00*

U.S. Cl. 73—15 R **4 Claims**



1. A process for testing the thermostability of shaped articles of thermoplastic material which comprises blowing a focused jet of hot gas at a temperature of 200° to 500° C. onto the surface of a shaped article and determining the time that elapses before the surface is visibly altered by the hot gas, said gas jet being delivered from a cylindrical nozzle having a diameter of from 2 to 10 mm. at a flow rate of 10 to 100 liters per minute.

4,000,643

APPARATUS FOR PRODUCING A COMPENSATING VOLTAGE

Robert P. Pearson, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1976, Ser. No. 671,650

Int. Cl.² G01B *7/00*; **G01L** *9/00*

U.S. Cl. 73—88.5 R **9 Claims**

1. Apparatus for producing a compensating voltage in response to changes in a parameter comprising in combination:

a first operational amplifier comprising a first non-inverting input, a first inverting input, and a first output;

means responsive to a parameter for producing an output voltage indicative of changes in the parameter;

connection means for applying said output voltage to said first inverting input;

means connecting said first non-inverting input to a current sink having a predetermined voltage;

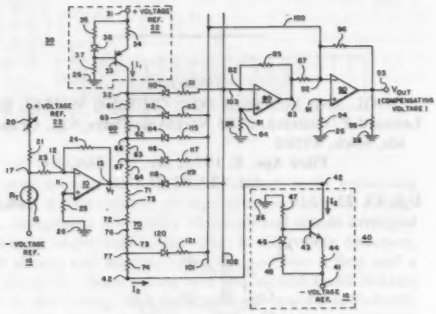
a first source of constant current having an input and an output;

a first plurality of series connected resistors, junctions being defined between said resistors;

means connecting said first plurality of resistors between said output of said first source of constant current and said first output, said first source of constant current having a reference voltage applied to the input thereof so that the constant current output thereof flows from the output of said first source toward said first output;

a second source of constant current having an input and an output;

a second plurality of series connected resistors, junctions being defined between said resistors;



means connecting said second plurality of said resistors between said first output and said output of said second source of constant current, said second source of constant current having a reference voltage applied to the input thereof so that the constant current output thereof flows from said first output toward said output of said second source;

a second operational amplifier comprising a second non-inverting input, a second inverting input and a second output;

a third operational amplifier comprising a third non-inverting input, a third inverting input, and a third output;

resistance means connecting said second output to said third inverting input;

resistance means connecting said second output to said second inverting input;

resistance means connected between said third output and said third inverting input;

a resistor and a diode connected in series between said second inverting input and one of said junctions;

a resistor and a diode connected in series between said third inverting input and another of said junctions; and

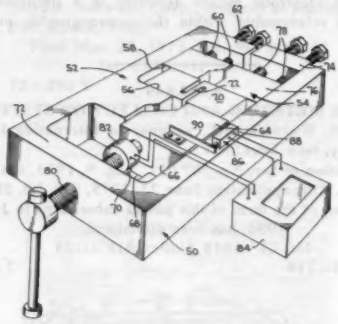
means connecting said second and third noninverting inputs to said current sink.

4,000,644

METHOD AND APPARATUS FOR TESTING TENSILE PROPERTIES

Edgar D. Oppenheimer, 527 Shore Acres Drive, Mamaroneck, N.Y. 10543

Filed Aug. 20, 1975, Ser. No. 605,986
Int. Cl.² G01N 3/08
U.S. Cl. 73—95 11 Claims



1. A method of testing the tensile properties of a metal body in the short transverse direction comprising the steps of

cutting a specimen bar from the metal body;

forming a single ligament extending in the short transverse direction of the specimen bar by forming a first slot in one surface of the specimen bar and forming a second slot in the opposite surface of the specimen bar;

clamping the slotted specimen bar on one side of the ligament with a stationary clamp positioned outwardly adjacent to said first slot and against the surface in which the first slot is formed so as to apply a force against said surface outwardly of the first slot;

clamping the slotted specimen bar on the opposite side of the ligament with a movable clamp positioned outwardly adjacent to said second slot and against said opposite surface in which the second slot is formed so as to apply a force against said opposite surface outwardly of the second slot; and

applying a force to the movable clamp relative to the stationary clamp to elongate the single ligament.

7. Apparatus for testing the tensile properties of a specimen of metal plate having first and second sides separated by a ligament having a slot on one side and a slot on the opposite side of said ligament comprising

a fixture including stationary clamp means for gripping the specimen adjacent one of the slots for holding the first side of the specimen stationary;

movable clamp means movably associated with said fixture relative to said stationary clamp means for gripping the second side of the specimen adjacent to the other of said slots;

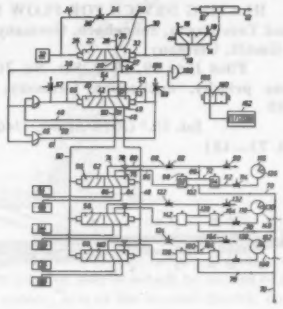
force applying means for applying a force to said movable clamp means to move said movable clamp means relative to said stationary clamp means and elongate the ligament of the specimen; and means for measuring the force applied by said force applying means and the displacement of said movable clamp means relative to said stationary clamp means.

4,000,645

APPARATUS FOR PNEUMATICALLY MONITORING CONDITIONS OF A WELL CIRCULATING SYSTEM

Ethell J. Dower, Houston, Tex., assignor to Warren Automatic Tool Co., Houston, Tex.

Filed June 6, 1975, Ser. No. 584,613
Int. Cl.² E21B 47/10
U.S. Cl. 73—155 26 Claims



6. Pneumatic apparatus for producing pneumatic signals having equal on and off times which are representative of a first on-off pneumatic signal having equal periods composed of unequal on and off times, comprising:

a repeater valve assembly adapted for receiving said first pneumatic signal and generating in response thereto a pair of substantially similar pneumatic signals; and

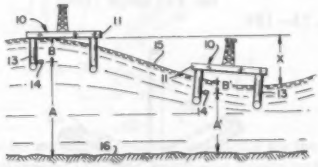
a frequency divider connected to said repeater assembly, for converting said pair of substantially similar pneumatic signals into a second pair of pneumatic signals, said second pair of pneumatic signals haivng equal on and off times.

4,000,646

WAVE HEIGHT MEASURING DEVICE

George Edward Mott, and Robert Lee Skaggs, both of Metairie, La., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 248,995, May 1, 1972, Pat. No. 3,910,111. This application July 14, 1975, Ser. No. 595,454
The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.
Int. Cl.² G01B 17/00
U.S. Cl. 73—170 A 2 Claims



1. Method for measuring wave height in a body of water from a marine structure floatably positioned in said body of water and subjected to vertical heaving resulting from movement of said water, said method comprising the steps of:

measuring a first distance between a reference point on said floating structure and the floor of said body of water,

simultaneously measuring a second distance between said reference point to the interface of the water and the atmosphere above said reference point,

repeating the above steps when said structure is at the crest and trough respectively of a wave to be measured,

correlating the distances obtained when the structure is at the wave trough and crest whereby to determine the height of said wave and the period of time which elapses between successive wave height measurements whereby to establish the period of time which occurs between successive waves.

4,000,647

HEATING DEVICE FOR FLOW SONDES

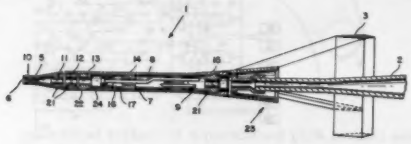
Reinhard Tauchmann, Steinebach, Germany, assignor to Dornier GmbH, Germany

Filed June 29, 1972, Ser. No. 267,500

Claims priority, application Germany, July 31, 1971, 2138495

Int. Cl.² G01F *21/00, 1/46*

U.S. Cl. 73—181 **1 Claim**



1. In a flow sonde particularly for measuring aerodynamic values in aircraft such as the total pressure, the static pressure, and the total temperature,

the improvement which comprises a plurality of thermally controlled resistor means in the sonde body, said means having a low increase of resistance within a specific temperature range below the Curie temperature and a high increase of resistance in an adjacent range above the Curie temperature,

said resistor means having an annular configuration and resting with the circumferential surface area thereof against the inner wall of said sonde body at points subject to ice deposits, and being electrically connected in parallel,

whereby there is obtained a high heating power at low ambient temperature and a limitation of the power absorption when a predetermined temperature is reached.

4,000,648

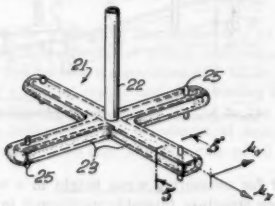
HIGH SENSITIVITY FLOWMETER

Jack R. Olson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,304

Int. Cl.² G01F *1/58*

U.S. Cl. 73—189 **13 Claims**



1. An oceanographic flow sensor of the electromagnetic type comprising:

elongated conductive coil means having a major and a minor axis, relatively configured for defining a relatively small central area for creating a magnetic field therein in response to electrical currents flowing in said conductive coil means having a field strength of approximately five times the strength of a circular coil of the same diameter as the major axis;

spaced electrode means located within said small central area and configured and structurally adapted to interact with ocean currents for effectively sensing fluid flow thereacross;

encasing means enclosing said elongated conductive coil means for providing a protective cover therefor and for supporting said spaced electrode means in a fixed position with respect to said elongated conductive coil means and making a unitary assembly therewith; and

support means effectively connected to said encasing means for positioning said elongated conductive coil means and spaced electrode means assembly in a predetermined spatial relationship within the oceanographic environment.

4,000,649

URINE METERING AND COLLECTION SYSTEM

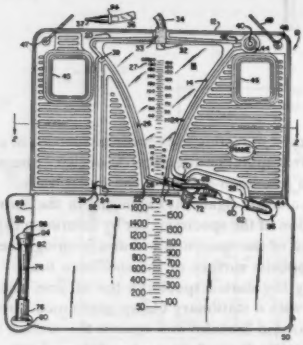
Paul Hanifl, Warwick, R.I., assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 387,011, Aug. 9, 1973, Pat. No. 3,961,529. This application June 23, 1975, Ser. No. 589,581

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.² A61B *5/00;* **G01F** *11/28*

U.S. Cl. 73—219 **7 Claims**



1. A urine metering and collection system comprising:

a. a stiff head member including a closed volume calibrated chamber having a substantially flat front wall, a substantially flat rear wall, a top wall, and first and second sidewalls, at least a section of one of said walls having volumetric calibrations thereon, said one of said walls having the calibrations thereon or adjacent thereto being transparent, the sidewalls continuously converging downwardly towards each other throughout at least a major portion of the length of chamber, such that each horizontal section of the chamber within said major portion is substantially rectangular and has a smaller volume per unit of height than does the next adjacent upper horizontal section of the chamber, an outlet passageway at the bottom of said chamber, an inlet passageway communicating with the chamber adjacent to the top of the chamber, and an overflow passageway having one end in fluid-flow communication with said chamber adjacent to the top thereof;

b. an inlet tube attached at one end to said head member and in fluid-flow communication with said inlet passageway, the other end of said inlet tube being adapted for connection to a catheter; and

c. a collection bag fixedly secured to the head member below said chamber and having a first opening in fluid-flow communication with the other end of said overflow passageway, and a second opening in fluid-flow communication with said outlet passageway,

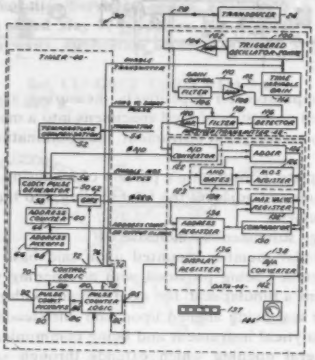
said head member being formed of two unitary plastic sheets molded to form said chamber, said outlet passageway, and said overflow passageway, said sheets being sealed together along the perimeter thereof, along the periphery of the chamber, along the length of said overflow, and along the periphery of the outlet passageway, said overflow passageway being formed as an integral part of the head member.

4,000,650

METHOD AND APPARATUS FOR ULTRASONIC MATERIAL LEVEL MEASUREMENT

Ellery P. Snyder, Norwalk, Conn., assignor to Bindicator Company, Port Huron, Mich.

Filed Mar. 20, 1975, Ser. No. 560,244
Int. Cl.² G01F 23/28
U.S. Cl. 73—290 V **46 Claims**



1. In a control system for use in monitoring the level of material in a storage tank, the combination comprising,

transducer means directing ultrasonic pulses toward and receiving echo response pulses reflected from the upper surface of said material,

means operatively connected to said transducer means to sample said echo response pulses at preselected intervals which are a function of distance,

means converting each of said sampled response pulses to digital signals having a numerical value indicative of the intensity of each said echo pulse relative to one another,

means integrating said sampled and digitizesd response pulses from successively transmitted pulses over a preselected pulse sequence according to apparent distance of said transducer means from said material surface,

means storing said integrated response pulses serially according to apparent distance, and

means monitoring said integrated pulses to provide an indication of actual distance, which is a function of material level, upon completion of said pulse sequence.

4,000,651

LIQUID LEVEL INDICATOR

Frank Christiansen, Oslo, Norway, assignor to Norapp A/S, Oslo, Norway

Filed Jan. 15, 1976, Ser. No. 649,353
Claims priority, application Norway, Jan. 20, 1975, 165/75
Int. Cl.² G01F 23/12
U.S. Cl. 73—314 **4 Claims**

1. Liquid level indicator which comprises a float which is movable along the exterior of a tube which extends substantially vertically in the liquid container, and within which tube is movable up and down a sensor which reacts magnetically on the float and thereby controls the direction of rotation of an electric motor exterior the liquid container, for moving the sensor by means of a rigid flexible metal band which is perforated in the longitudinal direction and coated with an electrically insulating material and acts as one electric conductor between the sensor and the control means for the motor,

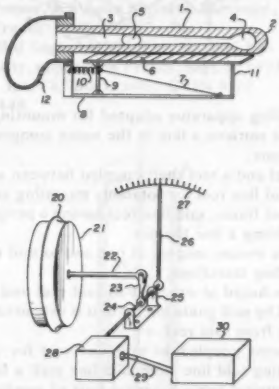
characterized in that the tube is a flexible metal tube with a bellowslike wall the interior side of which by means of a sliding contact on the sensor, acts as the second electric conductor between the sensor and the control means.

4,000,652

METHOD AND DEVICE FOR MEASURING THE CORRECTION FACTOR

Klas Rudolf Wiklund, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed May 4, 1973, Ser. No. 357,492
Claims priority, application Sweden, May 10, 1972, 6173/72
Int. Cl.² G01N 9/26
U.S. Cl. 73—336 **2 Claims**



1. A device for measuring a correction factor for the velocity of electromagnetic radiation in air; said device including:

a pressure responsive vessel having a gas-tight chamber therein and an outer surface for providing an enclosed volume in said gas-type chamber whose size changes in response to the pressure of gas in said gas-tight chamber and on said outer surface;

a predetermined quantity of gas sealed into said gas-tight chamber; said pressure responsive vessel including thermal conductor means for varying the temperature of said predetermined quantity of gas in response to the temperature of said outer surface;

means for sensing the size of said enclosed volume to provide a measurement of said correction factor;

the device being characterized in that said pressure-respon-

sive vessel includes a tube having a hollow therein, sealed at one end, and said predetermined volume of gas is shut in said hollow by a liquid drop arranged in said hollow;

the hollow has a conical shape, so that the cross-section of the hollow increases with increasing volume, as a result of which the change in position of the liquid drop becomes a linear measure of the factor wanted; and

a scale, mounted adjacent to said tube, for direct reading of said device based upon the position of said liquid drop.

4,000,653

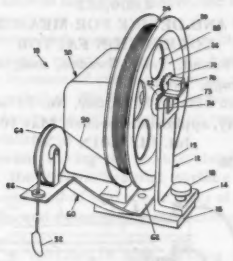
TROLLING APPARATUS

William M. Booth, Grand Haven, and James E. Rieth, Grand Rapids, both of Mich., assignors to James E. Reith, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 274,505, July 24, 1972, Pat. No. 3,916,555. This application Oct. 20, 1975, Ser. No. 623,732

Int. Cl.² G01K *7/00*

U.S. Cl. 73—343 R **12 Claims**



1. A trolling apparatus adapted for mounting to a boat to pay out and retrieve a line in the water comprising:

a reel frame;

a line reel and a reel shaft coupled between said reel frame and said line reel for rotatably mounting said line reel to said reel frame, said line reel having a peripheral channel for holding a line therein;

line guide means coupled at one end to said reel frame and extending therefrom;

a line anchored at one end to said reel and guidably supported by said guide means as it is extended and retracted to and from said reel;

drive means coupled to said line reel for extending and retracting said line from said line reel; a line comprising an electrical cable having a pair of conductors wherein one end of said line has temperature sensing means coupled thereto and the end of said line anchored to said reel is coupled to a slip ring assembly positioned on said reel frame to provide fixed electrical contacts communicating with said temperature sensing means wherein said slip ring assembly includes a disc of insulating material having a pair of spaced annular electrical contacts on one face thereof, said disc positioned on one end of said rotatable reel shaft and having said annular contacts coupled to said conductors of said electrical cable;

a pair of fixed contact arms each positioned to continuously contact one of said annular contacts as said reel shaft rotates; and

temperature indicating means coupled to said fixed contacts to provide a reading of the temperature of the sensing means.

4,000,654

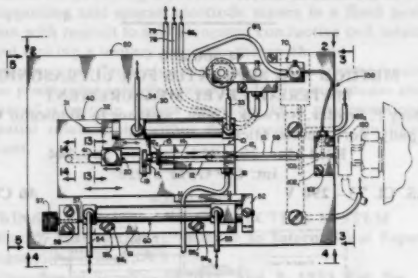
AUTOMATIC FLUID INJECTOR

Rano J. Harris, Jr., 4423 S. Park Drive, Baton Rouge, La. 70816

Filed Oct. 1, 1975, Ser. No. 618,374

Int. Cl.² G01N *1/02*

U.S. Cl. 73—422 GC **10 Claims**



1. In apparatus for repetitively measuring and injecting preselected quantities of fluid specimens into a media such as an inlet to an analytical instrument, the combination comprising

a base plate, constituting a portion of a housing, which can be mounted adjacent the inlet leading into the analytical instrument,

a syringe sub-assembly inclusive of

a tubular member mounted upon said base plate, said member being provided with an opening which contains a tubular seal, the axial opening within said tubular seal being aligned upon said inlet leading into the analytical instrument and being communicated with a lateral opening which extends through said tubular member and seal,

a slide plate mounted upon said base plate, movable in the direction of said tubular member,

a needle syringe mounted upon said slide plate, said syringe including a barrel within the forward end of which is mounted a hollow needle provided with a forward opening, the needle being extendable into the axial opening of the seal within said tubular member on movement of said syringe, and within the rearward end of which syringe is mounted a reciprocable plunger,

a means mounted upon said slide plate for actuating and driving the plunger of said syringe,

a means mounted on said base plate operatively engaged with said slide plate for reciprocal movement thereof, a magazine

inclusive of means for transporting a fluid specimen contained in a vial, with a resilient, puncturable closure,

an injector feed sub-assembly inclusive of

a probe assembly comprised of a cylinder piston unit, the piston end of which is projected upwardly and affixed via connecting means to the probe assembly, the probe assembly being comprised of one or more downwardly directed hollow probes which are projectable for penetration of said puncturable closure of a fluid specimen containing vial delivered into position below and in the path of a hollow probe by the magazine which is located below the base plate, an upper opening within a probe being communicated with a pressurized gas source for conveyance of pressurized gas via the lower opening within said probe into the vial, an upper opening of a probe being communicated with the lateral opening within the tubular member of the syringe sub-assembly for conveyance of the fluid specimen from the vial via the lower opening within said probe to the dispensing end of the needle of the syringe, and an on-off valve which can be actuated to initiate the flow of pressurized input gas to the probe used for pressuriz-

ing the vial, whereby, on thrust of the dispensing end of the needle into said tubular member of the syringe sub-assembly via activation of the actuation and drive means which produce movement of the slide plate, and on penetration of the puncturable closure of a vial by a probe, a pressurized fluid can be injected through a probe into the vial to pressurize the fluid specimen contained therein, the fluid specimen then transferred from the vial via a hollow probe to the lateral opening within said tubular member to the opening within the dispensing end of the needle, to purge, clean and fill the syringe with a preselected quantity of the fluid specimen for subsequent injection.

4,000,655

MEASURING DEVICES FOR BORES AND DUCTS

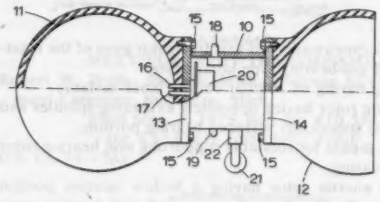
Trevor Clifford Jones, Stroud, England, assignor to Underground Location Services Limited, England

Filed May 7, 1975, Ser. No. 575,223

Claims priority, application United Kingdom, May 8, 1974, 20303/74

Int. Cl.² G01B *5/00;* **G01M** *3/02*

U.S. Cl. 73—432 R **9 Claims**



1. A measuring device for detecting surface irregularities on the internal walls of an elongated duct which reduce the nominal internal cross-section of the duct by more than a predetermined amount, said duct containing a fluid flowable therethrough, said measuring device comprising:

a sealed envelope containing fluid which is isolated from the fluid in the duct, said envelope having an external dimension less by said predetermined amount than the nominal internal cross-section of the duct and having a wall deformable upon contact with said irregularities for altering the fluid pressure within said envelope;

means responsive to the flow of fluid through the duct for moving said envelope along the duct; and

means for comparing the pressure of the fluid in the envelope with the pressure of the fluid in the duct for ascertaining pressure alterations within the envelope resulting from deformation of said flexible envelope wall by contact with the irregularities as an envelope is moved along the duct.

4,000,656

APPARATUS FOR DESIGNING AND TESTING PROPER VALUES OF PARAMETERS RELATING TO SUPPORTING HYDRODYNAMICALLY LUBRICATED BEARING JOURNALS

Alessandro Moioli, Via Fornaci, 2, Nembro (Bergamo), Italy (24027)

Filed Dec. 24, 1975, Ser. No. 644,298

Claims priority, application Italy, Jan. 10, 1975, 2902/75

Int. Cl.² G01N *19/08*

U.S. Cl. 73—432 R **7 Claims**

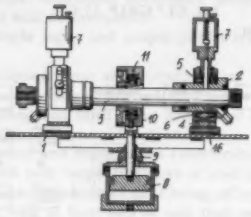
1. An apparatus for designing and testing the proper values of parameters relating to supporting hydrodynamically lubricated bearing journals, comprising:

a base;

two independent bushings mounted on said base;

a shaft mounted in said bushings;

a device coupled to said shaft between said bushings for load application to said shaft, said shaft and bushings being electrically insulated from the remainder of the apparatus;



ball joints and bearings rockably mounting said bushings for self-alignment with said shaft; and

at least one detecting device associated with each of the bushings and said shaft, said detecting device being adapted to indicate the value of a selected parameter.

4,000,657

APPARATUS FOR MEASURING THE APPARENT WEIGHT OF A SLUDGE CHARGING A LIQUID

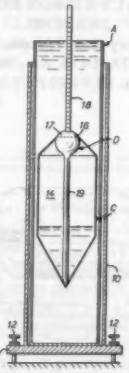
Yves Marie Ponsar, 6 avenue Marcelin Berthelot, 93250 Villemonble, France

Filed Sept. 2, 1975, Ser. No. 609,820

Claims priority, application France, Sept. 9, 1974, 74.30429

Int. Cl.² B01L *3/00;* **G01N** *9/12*

U.S. Cl. 73—448 **8 Claims**



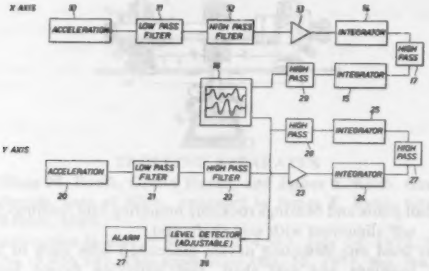
1. Apparatus for measuring the apparent weight of sludge charging a liquid, comprising a thermally insulated container having an open end, a bag shaped to fit into the said container for immersion in liquid in the said container, said bag being starshaped when empty and collapsed and expanding to a triangular cross-section when full, said bag having an upper opening, a buoyant ball engaged within said bag beneath said opening thereof for supporting said bag, and a graduated rod surmounting the ball for measuring the level of the bag and ball assembly.

4,000,658

METHOD AND APPARATUS FOR MEASURING DISPLACEMENT OF FIXED STRUCTURES

Thomas R. Schmidt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 21, 1975, Ser. No. 634,089
Int. Cl.² G01P *15/02*
U.S. Cl. 73—490 **10 Claims**



1. A method for measuring the displacement of the free end of a fixed structure comprising:

positioning a pair of force balance accelerometers on said free ends to measure the acceleration of the structure along two axes at right angles;

converting the measured acceleration along the two axes to related electrical signals;

filtering the related electrical signals a first time to remove the frequencies above the desired frequency of the structure;

filtering the related electrical signals a second time to remove the low frequency components produced by drift of the electronic circuits, velocity and displacement of the inertial reference device; and

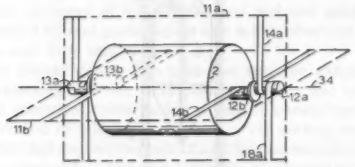
integrating each of the filtered signals twice to produce a signal related to velocity and displacement along each of the axes.

4,000,659

ZERO STIFFNESS TAUT RIBBON ROTARY SUSPENSION SYSTEMS

Yao Tzu Li, Huckleberry Hill, Lincoln, Mass. 01773

Filed Feb. 25, 1975, Ser. No. 552,877
Int. Cl.² G01P *15/00*
U.S. Cl. 73—514 **20 Claims**



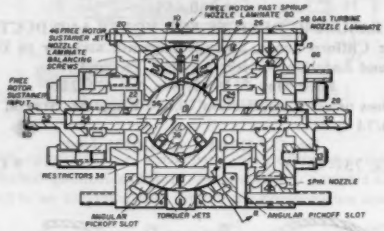
1. A rotary suspension system comprised of a first member, a second member, a pivot axis representing the desirable rotary mode of freedom of the second member with respect to the first member, at least one ribbon plane containing the pivot axis, at least one set of straight rod segments attached to the said second member and tangent to each ribbon plane along the pivot axis, a set of ribbons for each rod segment each with one end attached to and wrapped around over the said rod segment for a small arc and then departing from the rod at the pivot axis to fan out along the said ribbon plane in various directions with respect to the pivot axis; all ribbons being stretched and attached to the first member at the outer ends of the said ribbons while remaining within the associated ribbon plane whereby said second member is supported for rotation about the pivot axis for rotation with minimum uncertainty.

4,000,660

DRIFT-COMPENSATED FREE-ROTOR GYRO

Rolf K. Brodersen, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 31, 1975, Ser. No. 627,637
Int. Cl.² G01C *19/30*
U.S. Cl. 74—5.43 **4 Claims**



1. A fluidic/pneumatic two-axis free-rotor gyro of the rotating spherical gas-bearing type comprising:

a. a casing having an annular curved inner surface;

b. a bearing rotor having oppositely extending spindles and a central spherically surfaced bearing portion;

c. bearing means for rotatably supporting said bearing rotor in said casing;

d. a free enertia rotor having a hollow interior portion containing said spherical portion of said bearing rotor with the interposition of a gap forming a gas bearing for said free rotor and a curved portion mating with, but spaced from, said casing curved inner surface to form a windage air gap;

e. a gas turbine mounted on one of said spindles for rotating said bearing rotor;

f. said gas turbine and said free rotor having spin-up buckets for bringing said turbine and rotor up to speed and reaction jets for sustaining desired speed when connected to a source of pneumatic power; and

g. a pneumatic spin monitor pickoff system connected to provide control signals representative of the free rotor frequency and bearing rotor frequency.

4,000,661

TWO-SPEED MECHANICAL QUILL FEED AND SPINDLE DRIVE MECHANISM FOR A MACHINE TOOL

Klaus Menzel, Orchard Lake, Mich., assignor to Bendix Machine Tool Corporation, Warren, Mich.

Division of Ser. No. 462,286, April 19, 1974, Pat. No. 3,885,635. This application Feb. 3, 1975, Ser. No. 546,567
Int. Cl.² F16J *15/50;* **F16H** *1/18, 35/00*
U.S. Cl. 74—89.15 **4 Claims**

1. A quill drive comprising:

a housing;

a hollow quill shaft;

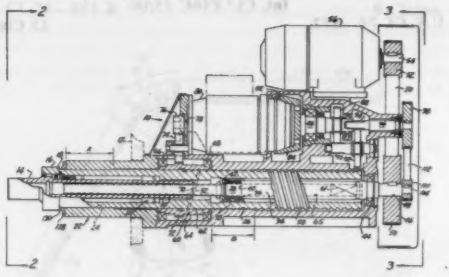
a drive member rotatably mounted in said housing surrounding said quill shaft and fixed against axial movement;

means mounting said quill shaft in said housing for slidable longitudinal movement along its axis including spaced bearing surfaces on either side of said drive member;

cam means drivingly connecting said quill shaft and said drive member producing said longitudinal movement of said quill shaft upon rotation of said drive member in said housing;

drive means for rotating said drive member;

a spindle shaft rotatably mounted within said quill shaft and adapted to be carried by said quill shaft with said longitudinal movement; and



means for rotating said spindle shaft in said quill shaft while said quill shaft is undergoing said longitudinal movement in said housing.

4,000,662

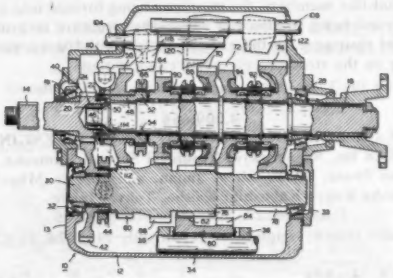
MULTIPLE INPUT TRANSMISSION

Robert W. Wolfe, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Sept. 5, 1975, Ser. No. 610,584

Int. Cl.² F16H *3/08, 3/02, 37/00*

U.S. Cl. 74—331 **30 Claims**



1. A multiple input transmission comprising:
a. a transmission housing;
b. a power input shaft having a tubular extension;
c. a power output shaft axially aligned with said input shaft;
d. a countershaft parallel to said output shaft;
e. a first input gear affixed to said input shaft;
f. a second input gear journalled for rotation on said tubular extension;
g. a third input gear journalled for rotation on said output shaft;
h. clutch means for drivably connecting said second input gear to said input shaft and, alternatively, for drivably connecting said third input gear to said input shaft;
i. a first driven gear journalled for rotation on said countershaft and in constant mesh with said first input gear;
j. clutch means for drivably connecting said first driven gear to said countershaft;
k. a second driven gear affixed to said countershaft and in constant mesh with said second input gear;
l. a third driven gear affixed to said countershaft and in constant mesh with said third input gear;
m. at least one output shaft gear journalled for rotation on said output shaft;
n. at least one driving gear affixed to said countershaft and in constant mesh with said at least one output shaft gear; and
o. at least one clutch means for drivably connecting said at least one output shaft gear to said output shaft, said first, second and third input gears, by having mutually different pitch circle diameters, permitting three different ratio inputs to said countershaft.

30. A multiple input and output power transmission comprising:
a. axially aligned input and output shafts;
b. a single countershaft aligned with said output shaft;
c. first, second and third input gears, said third input gear being journalled on said output shaft;
d. first, second and third driven countershaft gears in constant mesh with respective ones of said input gears, said third driven countershaft gear being affixed to said countershaft; with at least two of said first and second input and said first and second driven countershaft gears being journalled relative to said input shaft and countershaft respectively and any remaining ones of said aforesaid gears being affixed relative said input shaft and countershaft;
e. a plurality of output shaft gears, with one of said output shaft gears also being capable of serving as one of said input gears;
f. a plurality of driving countershaft gears, with each of said driving countershaft gears being intermeshable with a separate one of said output shaft gears, with one of said driving countershaft gears also being capable of serving as one of said driven countershaft gears; with at least one gear of each pair of intermeshable output shaft gears and driving countershaft gears being journalled relative to its respective shaft and any remaining gears of said pairs of intermeshable gears being affixed relative to their respective shafts; and
g. multiple clutch means for selectively drivably connecting one of said driven countershaft gears with one of said input gears and selectively drivably connecting one of said output shaft gears with said driving countershaft gears.

4,000,663

DAMPER ACTUATOR

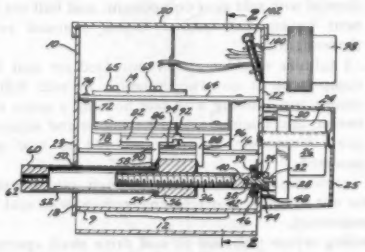
Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 22, 1974, Ser. No. 499,786

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² F16K *31/04*

U.S. Cl. 74—424.8 VA **10 Claims**



1. A mechanical transducer comprising:
a housing having parallel side walls and end walls;
a motor drive unit with a rotary shaft output carried on one end wall thereof;
a lead screw rotatably carried by thrust bearing means on said end wall and in driven connection to said rotary shaft;
track means defined by channels on opposite side walls parallel to and coextensive with said lead screw;

a traveling nut member engaged on said lead screw and bearing opposite, radially extending side flanges with outboard bulbous edges engaged in said channels;

a tubular member carried by said traveling nut member generally coaxially with said lead screw and extending through the opposite end wall of said housing; and

said tubular member having a closed outboard end bearing work receiving means.

4,000,664

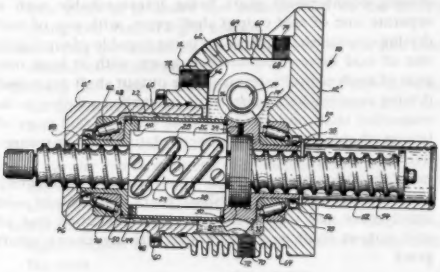
MECHANICAL ACTUATOR

John D. Christensen, Charlotte, N.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C.

Filed Sept. 8, 1975, Ser. No. 611,211

Int. Cl.² F16H *1/18, 57/04*

U.S. Cl. 74—424.8 R **8 Claims**



1. A mechanical actuator comprising:

a. a housing,

b. a drive shaft extending into said housing through an aperture therein and being rotatably disposed therein with gear means fixed thereon,

c. a gear-nut assembly rotatably mounted in said housing and including:

i. a gear component in driven engagement with said drive shaft gear means;

ii. a ball nut component fixed for rotation at one end thereof with said gear component, said ball nut component having ball return means exposed exteriorly thereon; and

iii. a tubular shield member mounted on said ball nut component in covering relation to said ball return means and defining with said housing a space therebetween, said shield member having an end adjacent said gear component sealingly secured to said gear-nut assembly,

d. a screw member extending through said housing and gear-nut assembly in driven engagement with said ball nut component,

e. sealing means disposed at said drive shaft aperture and between said gear-nut assembly and said housing, said sealing means in combination with said tubular shield member cooperating to seal oil within the space between said shield member and said housing including the space in which said drive shaft gear means and said gear-nut assembly are disposed and to seal oil from said ball return means and screw member, and

f. oil contained in said sealed space to lubricate said gear means and gear-nut assembly and dissipate heat therefrom to said housing.

4,000,665

WOVEN FILAMENT ROTOR STRUCTURE

David W. Rabenhorst, Clarksville, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Aug. 26, 1975, Ser. No. 607,919

Int. Cl.² F16C *15/00*

U.S. Cl. 74—572 **13 Claims**

1. An energy storage structure rotatable about an axis of rotation extending transversely therethrough, the structure comprising a plurality of substantially identical anisotropic filament-like members, the members being formed into a disc shape and being interwoven within the structure to produce bi-axial resistance to the radial and tangential stress pattern acting on the structure.

4,000,666

MEANS FOR ACTUATING BALANCER OF ENGINE

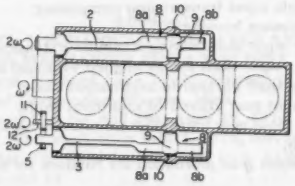
Tadahiko Ito, Nagaokakyo; Yoshinori Shiomi, Kameoka, and Seizo Iwasa, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1975, Ser. No. 553,465

Claims priority, application Japan, July 24, 1974, 49-85453

Int. Cl.² F16F *15/10*

U.S. Cl. 74—604 **5 Claims**



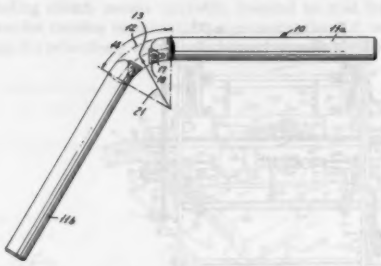
1. Means for actuating a balancer of an engine, comprising at least one pair of balancer shafts located on opposite sides of a crankshaft of the engine at given distances from an axis of the crankshaft and driven by the crankshaft at a speed twice the speed thereof, the axes of said balancer shafts being substantially parallel to said axis of the crankshaft and being situated at different heights relative thereto, and reversing mechanism for rotating the lower one of said balancer shafts in a direction opposite to that of the crankshaft, said reversing mechanism including a first gear mounted on a rotatable shaft of a subsidiary device driven by said crankshaft and a second gear mounted on said lower balancer shaft and engaged with said first gear to rotate it in said opposite direction.

4,000,667

BENDING BAR CONSTRUCTED BY BENDING

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Detroit, Mich.

Filed May 12, 1975, Ser. No. 576,964
Int. Cl.² B21K 21/00
U.S. Cl. 76—101 R 8 Claims



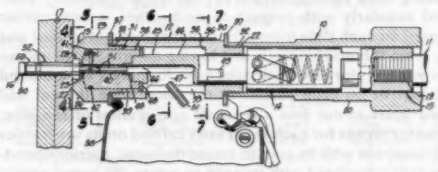
1. The method for manufacturing a boring bar comprising the steps of bending a straight bar to provide an intermediate curved portion and an obtuse included angle relationship between the remaining straight portions, cutting the curved portion of said bar to provide a curved end portion on each of two straight portions, machining a chip clearance path and an insert pocket with an offset portion resulting from said bend providing a support surface for an offset cutting point of an insert.

4,000,668

BLIND BOLT FASTENER INSTALLATION TOOL WITH AN APPARATUS FOR RETRIEVING SEVERED BLIND BOLT FASTENER STEMS

Ben C. Keasler, 864 W. 16th St., Newport Beach, Calif. 92660

Filed Nov. 3, 1975, Ser. No. 628,049
Int. Cl.² B25B 13/06
U.S. Cl. 81—55 6 Claims



1. An apparatus for retrieving the severed stems of blind bolt fasteners to be used in conjunction with a blind bolt fastener installation tool, which comprises:

a. means for retaining a plurality of severed stems;

b. means for directing a severed stem into said retaining means;

c. means for restraining a severed stem from falling from the installation tool until disengaged from said restraining means into said directing means, said restraining means being in communication with said retaining means, said directing means comprises:

d. a housing operably connected to the installation tool said housing being further defined as having a first aperture adapted to pass severed stems therethrough; and

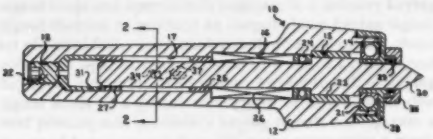
e. a rotatable member positioned substantially within said housing, said rotatable member having a passageway therethrough substantially along its axis of rotation for receiving severed stems, said rotatable member being further defined as having a second aperture adapted to pass severed stems therethrough.

4,000,669

CENTER DEVICE

Ernest E. Krupp, 19916 Thousand Oaks, Clemens, Mich. 48043

Filed Jan. 26, 1976, Ser. No. 652,423
Int. Cl.² B23B 23/04
U.S. Cl. 82—33 R 4 Claims



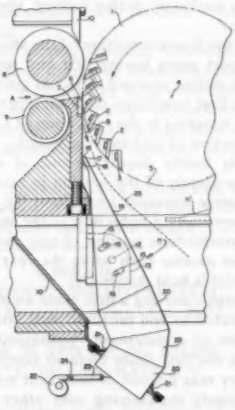
1. Improvement in a machine tool center device having a hollow body and a center shaft therein, said shaft having a conical front end, bearing means between said body and shaft for moveably supporting the latter, said improvement comprising a center device which has means for converting the same from a live center to a dead center and vice versa, means for supporting said shaft in said body for both rotation and reciprocation in respect thereto, said converting means preventing rotation of said shaft while permitting reciprocation thereof, said converting means being accessible from the exterior of said body for insertion or removal in respect thereto, yieldable means in said body operative upon said shaft for urging said front end outwardly of said body, a thrust cap rotatably carried on the front end of said body having an aperture therein through which said front end projects, said thrust cap being held fast against reciprocative movement relative to said body, a nose cap carried on said thrust cap, said nose cap having an aperture therein through which said front end projects, said shaft, in use of said center device, being yieldably retracted in respect to said body by said workpiece so that the latter abuts said nose cap, said nose cap serving as a locator for said workpiece and rotating therewith.

4,000,670

METHOD AND APPARATUS FOR NOISE SUPPRESSION

William Fleetwood, St. Helens, England, assignor to Leesona Plastics Machinery Ltd., Warrington, England

Filed June 3, 1974, Ser. No. 476,195
Claims priority, application United Kingdom, July 10, 1973, 32923/73; Nov. 2, 1973, 51088/73; Feb. 7, 1974, 5586/74
Int. Cl.² B26D 7/00
U.S. Cl. 83—42 19 Claims



16. A method for reducing the noise level in apparatus having movable means and second means arranged in close proximity to said movable means with said second means

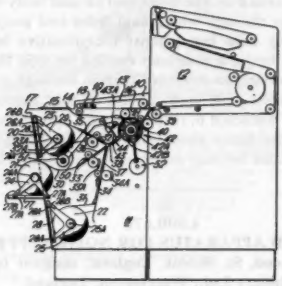
defining an approaching zone for said movable means and a receding zone for said movable means wherein the movable means and second means coact to produce noise, comprising the steps of, driving said movable means, and directing a substantially continuous positive pressure proximate to said receding zone and said movable means to thereby reduce the level of said noise.

4,000,671

TRANSPORT GUIDE FOR PLIABLE SHEET MATERIAL

Adi Kaikhushiroo Ashburner, Hargrave, England, assignor to Harper & Tunstall Limited, Wellingborough, United Kingdom

Division of Ser. No. 368,665, June 11, 1973, Pat. No. 3,951,023. This application Nov. 21, 1974, Ser. No. 525,890
Claims priority, application United Kingdom, June 12, 1972, 27419/72
Int. Cl.² B26D *1/12*
U.S. Cl. 83—42 **7 Claims**



1. A method of cutting a rear portion of pliable sheet material so as to allow a forward portion of the sheet material to be continuously fed forward while the rear portion of the sheet material is stationary during cutting, said method comprising the steps of:

guiding the forward portion of the sheet material through a transport guide having first and second guide members which define opposed adjacent guide surfaces for defining a first nonlinear path therebetween, said transport guide resulting in the formation of a loop in an intermediate portion of said sheet material;

positively bodily displacing one of said guide members, independently of the tension in said sheet material, in a transverse direction away from the other guide member for permitting a reduction in the size of the loop so that the intermediate portion of said sheet material follows a second shorter path while the rear portion of the sheet material is held stationary;

concurrently moving a first blade element, which is directly connected to and movable with said one guide member, relative to a stationarily positioned blade element with which the first blade element cooperates to cut the stationary rear portion of the sheet material; and

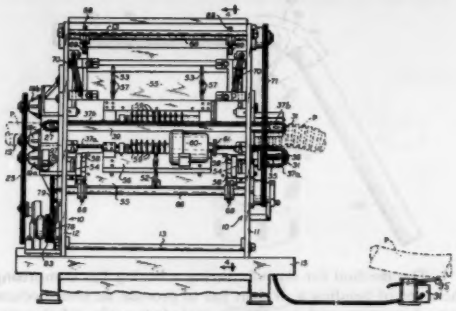
continuously maintaining said other guide member in a position so that the guide surface thereon is always disposed in a position wherein it is adapted for guiding engagement with the sheet material, even when said one guide member is being bodily moved away from the other guide member.

4,000,672

SLITTING MACHINE FOR CORRUGATED PIPE

Theodor K. Sitterer, Glen Cove, N.Y., and Siegfried Valentin, Chester, N.J., assignors to Altair National Corporation, Central Islip, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,644
Int. Cl.² B26D *5/20*
U.S. Cl. 83—203 **23 Claims**



1. A slitting machine for a corrugated pipe with the machine and pipe having the same axis comprising a frame, transporting means including at least two endless transporters, spaced mounting means carried by the frame and mounting each transporter uniformly spaced angularly with respect to each other and with reference to the axis, each transporter having an inner span with at least a major portion of the length thereof parallel to each other and the axis and straight, the straight span of each transporter being spaced from the axis a distance to engage the periphery of the pipe to support the same, each transporter having projecting means directly inwardly towards the axis for the inner span and spaced apart so as to enter an inwardly directed corrugation of the pipe, transporter operating means operatively connected with the transporters to drive the same in the same direction and at the same speed, slitting means positioned between each pair of transporters and directed radially inwardly with respect to the axis including slide means carried by the frame uniformly positioned angularly with respect to each other, a saw carrier mounted on each slide means for radial movement toward and away from the machine axis and having an inner edge and an outer edge, a plurality of circular saws forming a set mounted in alignment on each carrier at the inner edge thereof and spaced apart to cut into a separate corrugation of the pipe, saw motor means for each set of saws carried on its saw carrier and connected with its saws to rotate the same, carrier operating means connected with its saws to rotate the same, carrier operating means connected with each of the carriers to move the same radially inwardly towards the axis to sawing position and outwardly to retracted position with respect to the axis, transporter control means connected with the transporter operating means to operate the same, and slitting control means connected with the carrier operating means to operate the same.

4,000,673

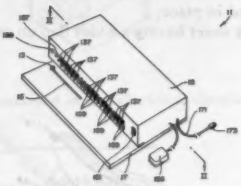
PUNCHING MACHINE

John W. Lyon, Hot Springs, Ark., assignor to Nineteen Sixties Corporation, Hot Springs, Ark.

Filed June 21, 1972, Ser. No. 264,834
Int. Cl.² B26F *1/06*
U.S. Cl. 83—526 **15 Claims**

1. A gang punch comprising a base, a pressure bar, means for slidably supporting said pressure bar a distance above said base to guidingly constrain the movement thereof along a vertical plane, a plurality of punch and coacting die means arranged in a row and attached to said base, said punch means having stock loading and stock piercing positions thereto, downward movement of said pressure bar being effective to drive the lower portions of selected ones of said punch means

into said die means to said stock piercing position and upward movement of said pressure bar being effective to carry said selected ones of said plurality of punch means to said stock loading position to constitute one complete cycle thereof, lever arm means, lever arm support means attached to said base, means for pivotally attaching said lever arm means to said lever arm support means, means for coupling one end of said lever arm means to said pressure bar, power drive means including clutch means operably coupled to said lever arm means for causing reciprocating movement thereof, switching means for selectively causing said clutch means to be engaged,



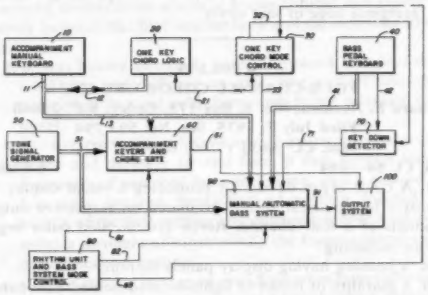
said means for coupling one end of said lever arm means to said pressure bar including shaft means, said one end of said lever arm means being provided with a bore for slidably receiving said shaft means, said bore extending substantially parallel with the longitudinal axis of said arm means and said shaft means protruding outwardly from said one end of said arm means towards said pressure bar, spring means for urging said shaft means towards said pressure bar, and ball means attached to the protruding end of said shaft means, said pressure bar being provided with a socket for receiving said ball means.

4,000,674

ONE KEY CHORDING SYSTEM FOR AN ELECTRONIC KEYBOARD INSTRUMENT

Wilford Rayburn Schreier, Bensenville, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed June 18, 1975, Ser. No. 587,905
Int. Cl.² G10H 1/00
U.S. Cl. 84—1.01 **2 Claims**



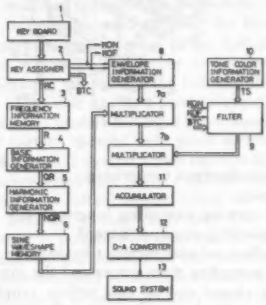
1. In an electronic keyboard instrument which includes:
a tone signal generating system for generating tone signals corresponding to notes in the musical scale;
an output system for translating tone signals into audible musical tones;
a set of tone signal keyers, each receiving one of said tone signals and being responsive to a keying signal on an input keying signal lead to key said tone signal to said output system; and
a keyboard having a plurality of control elements, each of said control elements being identified in standard musical keyboard terms with a particular note of the musical scale and being selectively operable to apply a primary keying signal on an input keying signal lead of an associated keyer;
a one key chording system comprising:
a set of chord gates, each coupled to one of said keying signal leads and operative in response to a primary keying signal thereon to produce an output chord keying signal;
a set of chord logic units, each coupled to one of said chord gates and operative in response to a chord keying signal to supply a plurality of secondary keying signals to keying signal leads of a preselected group of keyers such that said primary and secondary keying signals will operate a group of keyers associated with notes comprising a musical chord; and
inhibit means coupled to said chord gates for inhibiting operation of said chord gates in response to secondary keying signals.

4,000,675

ELECTRONIC MUSICAL INSTRUMENT

Tsuyoshi Futamase, and Masanobu Chibana, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 21, 1975, Ser. No. 634,306
Claims priority, application Japan, Nov. 25, 1974, 49-135728
Int. Cl.² G10H 1/00; G10F 1/00; G10H 1/02
U.S. Cl. 84—1.01 **5 Claims**



1. An electronic musical instrument of a type wherein harmonic components are combined to produce a musical tone waveshape comprising:
memory means for storing constant information corresponding to a desired frequency filter characteristic; and
calculation means for calculating level information of the particular frequency in said filter characteristic in response to the constant information read from said memory means and information of respective harmonic frequencies;
levels of harmonic components of a musical tone waveshape being controlled in accordance with said level information calculated by said calculation means.

4,000,676

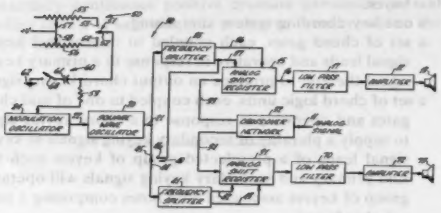
ELECTRONIC VIBRATO SYSTEM

David A. Love, 600 Langsdorf Drive, Apt. B-22, Fullerton, Calif. 92631

Filed Sept. 20, 1974, Ser. No. 507,890
Int. Cl.² G10H 1/04; H03H 7/30
U.S. Cl. 84—1.25 **9 Claims**

1. A method of modulating the frequency of an analog signal comprising:
dividing said analog signal into upper and lower frequency bands;

separately conducting said upper and lower frequency bands through parallel first and second analog delay lines under control of a digital clock signal; and



varying the frequency of said digital clock signal at a rate equal to the desired rate of modulation of said analog signal.

4,000,677

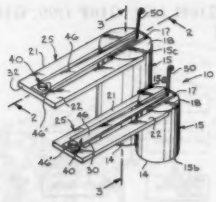
MOUTH ORGAN

Teddy W. Rabb, P.O. Box 838, Olla, La. 71465

Filed Sept. 4, 1975, Ser. No. 610,136

Int. Cl.² G10D *11/00*

U.S. Cl. 84—375 **12 Claims**



1. A mouth organ comprising:

a. a body;

b. an opening extending longitudinally of said body and intersecting one end thereof;

c. a hollow tubular member having one end closed with a slot extending thereacross and the other end open;

d. said closed end of said hollow tubular member being secured to said body so that the slot in said closed end communicates with and forms an axial extension of the longitudinal opening in said body;

e. said hollow tubular member extending laterally from said body to position said other open end of said hollow tubular member in spaced relation to said body for contact with the mouth;

f. reed means secured at one end to said body and having a longitudinal portion extending longitudinally of the opening in said body and the slot in said closed end; and

g. said reed means having a portion extending laterally therefrom adjacent said hollow tubular member for manual vibration of the longitudinal portion of said reed means within the opening in said body and slot in said closed end to create sound.

4,000,678

COVER FOR A MUSICAL INSTRUMENT

Richard A. Messina, 181 Barrows, Jamestown, N.Y. 14701

Continuation-in-part of Ser. No. 515,587, Nov. 29, 1974. This application Mar. 31, 1976, Ser. No. 672,403

Int. Cl.² G10G *7/00*

U.S. Cl. 84—453 **1 Claim**

1. A cover for a musical instrument having a sound box, a neck attached to one side of said sound box and extending therefrom and a bridge supported on another side of said soundbox,

a first means on said sound box for attaching a strap on the end thereof remote from said neck, and

a second means for attaching a strap on a corner adjacent said neck remote from said first mentioned means,

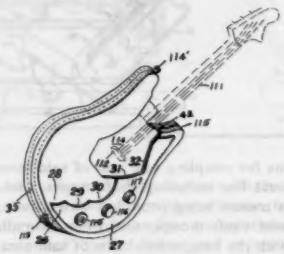
said sound box having a second corner on the end thereof adjacent said neck at the side thereof remote from said first mentioned corner,

a plurality of control buttons on one side of said sound box spaced from said bridge,

said cover comprising a front sheet and a back sheet, each having a fold line generally in the shape of the edges of said sound box of said instrument,

a marginal edge extending outward from said fold line, and adapted to be folded back at said fold line and to be stitched in place,

said back sheet having a wider flap on one side thereof than



said front sheet whereby when said rear sheet is folded back and sewn said flap can swing outwardly beyond said fold line,

said front sheet and said back sheet each having a notch cut therein to receive said first mentioned means for attaching a strap and a second notch cut in said flaps to receive said second mentioned means to attach a strap,

said front sheet being notched to receive said bridge and a plurality of openings in said front sheet for receiving said control buttons,

a control cover attached to said front sheet,

said control cover having openings registering with said holes in said front sheet and being generally crescent shaped and having a side cut out forming an edge to lie along the top of said front sheet,

said crescent shaped side of said cover registering with the marginal edge of said cover.

4,000,679

FOUR-CHANNEL COLOR ORGAN

Richard E. Norman, Rte. 8, Box 173, Easley, S.C. 29640

Filed July 7, 1975, Ser. No. 593,794

Int. Cl.² A63J *17/00*; **G09B** *15/02*

U.S. Cl. 84—464 **6 Claims**

1. A color organ device for producing a visual display responsive to electrical signals produced on respective output channels of a four channel stereo system, said color organ device including:

A. a housing having display panels therein,

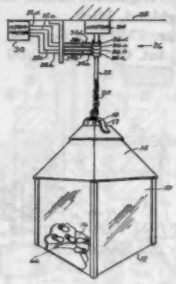
B. a plurality of banks of lights located behind said panels for illuminating said panels upon being energized,

C. an electric motor having a rotating output shaft connected to said housing for rotating said housing,

D. an interpreter means connected to said output channels of said stereo for producing a plurality of signals responsive to various frequency ranges produced on said output channels of said stereo.

E. a plurality of electrically conductive slip rings carried by said output shaft of said motor for providing an electrical path between said interpreter means and said banks of lights for energizing said lights responsive to respective signals produced by said interpreter means.

whereby said banks of lights are energized according to the



frequency ranges contained in the electrical signals produced by said stereo.

4,000,680

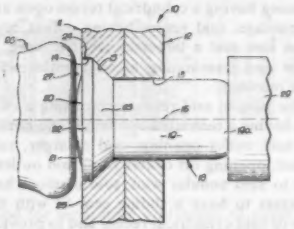
EXPANDING HEAD RIVETING METHOD AND SYSTEM

Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625

Continuation-in-part of Ser. No. 621,826, Oct. 14, 1975. This application Dec. 29, 1975, Ser. No. 645,242

Int. Cl.² F16B *19/06*

U.S. Cl. 85—37 11 Claims



1. In combination with a workpiece having a bore, a first substantially cylindrical counterbore of substantial length, and a second counterbore which is frusto-conical and tapers forwardly between the first counterbore and the bore and toward the bore,

a rivet having an axially extending shank received in the workbore and defining an axis, one end of said shank projecting beyond said bore and being adapted to be upset,

b. the rivet including a head having a rearwardly protruding dome and defining an end face, a first section located forwardly of said end face and dome, and a second and forwardly tapered frusto-conical section located forwardly of the first section and engaging said second counterbore throughout substantially the frusto-conical extent of said second section,

c. the first section having an undeformed substantially cylindrical outer surface of substantial length which interrupts the second section forward taper and extends at an angle thereto and which is of a diameter less than but about the same as the diameter of the first counterbore to provide clearance therebetween, said clearance having substantially the same radial dimension along the length of the first section, the length of the first section and of the first counterbore being approximately equal, the rivet first section being radially expandable into peripheral engagement with the first counterbore,

d. the dome adapted to be flattened so as to cause said radial expansion of the rivet first section so that said head end face becomes substantially flush with the work surface and said first section expands into said peripheral engagement with said first counterbore.

4,000,681

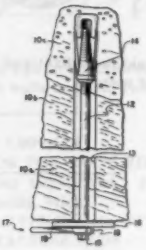
MINE BOLT TENSION INDICATOR

Chester P. Coldren, Canton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 12, 1975, Ser. No. 576,416

Int. Cl.² F16B *31/02*

U.S. Cl. 85—62 17 Claims



1. A mechanical device for visually indicating the tension in a monitored bolt or the like, said device comprising:

a helical spring washer inserted inbetween the head of the bolt and the surface against which the bolt head bears substantially resilient compression therebetween, said washer being fully compressed between the head of the bolt and the surface when tension in the bolt exceeds a predetermined maximum and being at least somewhat compressed between the head of the bolt and the surface when tension in the bolt equals a predetermined acceptable minimum, said washer having a pivot member on a radially outer surface thereof, said pivot member being spaced from the surface against which the bolt head bears by a first distance when said washer is fully compressed and spaced from said surface against which the bolt bears by a second distance, greater than said first distance, when the washer is compressed between the bolt head and the surface by the tension in the monitored bolt equalling a predetermined acceptable minimum; and

an elongated indicating member pivotally mounted at one end thereof to said washer, said indicating member having a pivot mount for cooperation with said pivot member to mount said indicating member to said washer, said indicating member having a face for engagement with said surface, said face being spaced from said pivot mount by a distance generally equal to said first distance, said face having an outer extremity at said one end thereof spaced from said pivot mount by a distance generally equal to said second distance.

4,000,682

SOLID PROPELLANT ROCKET MOTOR AND METHOD OF MAKING SAME

Joseph G. Thibodaux, Jr., Newport News, and Donald J. Lewis, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

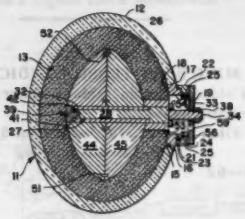
Division of Ser. No. 54,552, Sept. 7, 1960, Pat. No. 3,193,883. This application Jan. 16, 1963, Ser. No. 256,493

Int. Cl.² F42B *33/10, 3/00*

U.S. Cl. 86—1 R 8 Claims

1. A method of making a solid propellant rocket motor having a shaped fuel charge which comprises the steps of: forming a one piece motor casing having an aperture therein, assembling within said one piece casing a mandrel having an

overall diameter larger than the diameter of said aperture, casting a solidifiable propellant within said casing above said



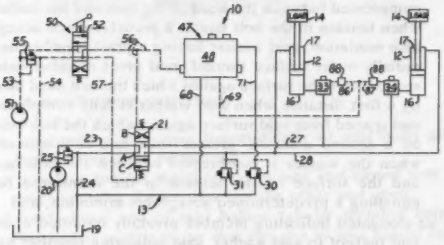
mandrel, curing said propellant and thereafter removing said mandrel from said motor.

4,000,683

HYDRAULIC LOAD LIFTING SYSTEM

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 27, 1975, Ser. No. 581,297
Int. Cl.² F15B *11/16, 13/042, 13/06*
U.S. Cl. 91—411 R **12 Claims**



1. In a hydraulic load lifting system including hydraulic motor means having a load supporting end, a source of pressurized fluid, a main control valve having load raising, lowering and holding positions, and a main control line for communicating fluid between the control valve and the load supporting end of the motor means, the improvement comprising:

vented load check valve means disposed within said main control line adjacent said hydraulic motor means to freely admit fluid to the load supporting end of the hydraulic motor means when the control valve is in its load raising position and to block fluid flow therefrom when the control valve is in its load holding position;

venting means for selectively venting the load check valve means when the control valve is in its load lowering position to allow fluid to escape from the load supporting end of the motor means; and

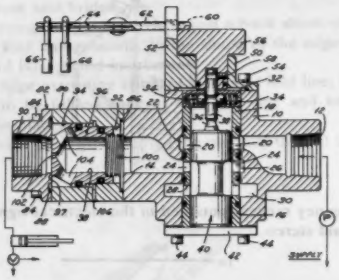
means for selectively prepressurizing the main control line between said control valve and the load check valve means to a pressure substantially equal to the pressure at the load supporting end of the motor means immediately prior to the venting of the load check valve means so that a fluid pressure balance exists on the opposite sides of the load check valve means when said valve means opens so as to prevent momentary load drop and hydraulic hammering.

4,000,684

SAFETY LOCK-OUT VALVE

Douglas W. Ruffley, Highland, Mich., assignor to Numatics, Incorporated, Highland, Mich.

Filed Mar. 27, 1975, Ser. No. 562,496
Int. Cl.² F15B *20/00*
U.S. Cl. 91—447 **1 Claim**



1. A safety system for fluid operated motors receiving pressure from an upstream fluid pressure source which comprises:

a. a fluid passage leading from an upstream pressure source to a downstream fluid operated motor,

b. a cut-off valve in said passage movable from a position closing said passage to a position opening said passage,

c. a safety valve structure in said passage between said cut-off valve and said fluid operated motor comprising:

d. a housing having a cylindrical recess open at both ends to said passage, said recess having a first bore at the upstream end and a larger concentric bore at the downstream end terminating at an annular wall around an outlet opening,

e. a valve plug in said recess comprising a cup-shaped element having a restricted opening in the bottom to register with said outlet opening, and a larger, relatively-unrestricted, opening off center from said outlet opening and open to said annular wall, said element having stepped diameters to have a sliding seal fit with the respective bores of said cylindrical recess and to provide differential effective pressure areas at opposite ends of said element within said bores, and

f. means biasing said valve plug toward said annular wall wherein said valve plug will permit an initial minimal flow of fluid under pressure to said outlet opening through said restricted opening and wherein said valve plug will be shifted by action of differential pressure on the effective end areas of said element to open said larger opening to said outlet opening when pressure is developed downstream of said safety valve sufficient to safely operate said fluid motor.

4,000,685

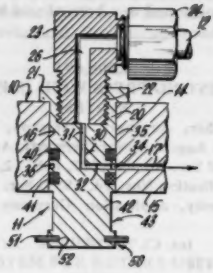
PUSH/PULL VALVE FOR TWO OR THREE WAY OPERATION

Edwin J. Montalvo, Jr., 283 Anderson St., Hackensack, N.J. 07601

Filed May 5, 1975, Ser. No. 574,464
Int. Cl.² F16K *11/07*
U.S. Cl. 91—469 **10 Claims**

1. A push-pull valve having a generally cylindrical body, an L-shaped passage within the body, a fitting in an axial socket at one end of said body for admitting fluid under pressure to an axially extending leg of said L-shaped passage and outlet means through a side wall of said body for delivery of fluid from a radially extending leg of said L-shaped passage, said body being formed with a circumferential groove at the outlet end of said radially extending leg, said body having a cylindrical portion of reduced diameter spaced from an end of said

body opposite said one end, a retaining lip integrally formed with said body at said one end extending circumferentially

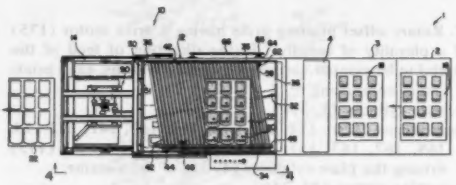


outward from said body and a retaining ring member, fitted in a groove encircling said body adjacent said opposite end.

4,000,686
SEPARATING MACHINE AND METHOD OF SEPARATING

William G. Young, 79 Atterbury Blvd., Suite 201C, Hudson, Ohio 44236

Filed Nov. 15, 1974, Ser. No. 524,251
Int. Cl.² B31B *1/20*; B26D *7/18*
U.S. Cl. 93—36 A 15 Claims



13. A method for separating a plurality of cards from the scrap of paperboard sheets from which they have been die cut except for small integral connecting tangs comprising the steps of:

feeding the sheet to and positioning the sheet between a pair of opposing dies;

moving the opposing dies in a direction transversely of the sheet feed direction into mutual contact with the sheet adjacent said tangs in a progression of locations across the sheet to separate the cards from the scrap;

moving the opposing dies to the open position so as to allow the scrap portion of the sheet to be removed from between the opposing dies; and,

receiving the cards after they are severed from the sheet.

4,000,687
METHOD FOR ERECTING CARTONS

Charles W. Adams, Walton, Ky., assignor to R. A. Jones & Company, Inc., Covington, Ky.

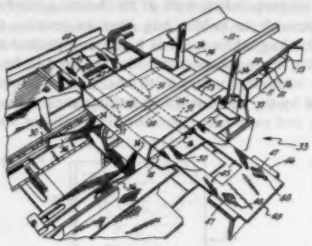
Filed Mar. 3, 1975, Ser. No. 554,767
Int. Cl.² B31B *1/78*
U.S. Cl. 93—53 M 1 Claim

1. The method of erecting tubular cartons each having top and bottom walls, a leading upwardly facing side wall, a trailing downwardly facing side wall and a central divider secured along score lines to said top and bottom walls, comprising the steps of,

engaging said bottom wall adjacent said trailing wall to provide a fulcrum about which to swing said trailing wall,

simultaneously engaging said bottom wall adjacent said divider to partially break the score line adjacent said bottom wall,

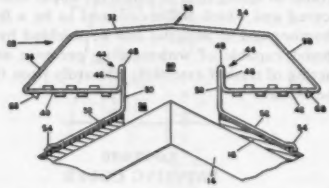
and pivoting said trailing side wall upwardly about its juncture with said bottom wall to effect simultaneous vertical orienting of said side walls and said central divider.



4,000,688
VENTILATOR FOR ROOF RIDGE

Richard C. Malott, Spring Lake, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed July 18, 1975, Ser. No. 597,029
Int. Cl.² F24F *13/08*
U.S. Cl. 98—42 A 9 Claims



1. A ridge vent for a roof having a cover portion and a pair of generally inwardly extending panels beneath and vertically spaced from said cover and means for securing said vent to a roof with said panels above and spaced from the roof, said ridge vent characterized in that said panels each have a plurality of elongated ventilation openings therein; said openings being arranged in tandem in a plurality of laterally spaced rows; each of said openings having an elongated strap overlying the same, integral with said panel; each of said straps having a center portion in a plane offset from and parallel to the plane of said panel for defining a pair of laterally opening air flow passages one on each side of said strap, and said straps in alternate rows being offset in opposite directions from the plane of said panel.

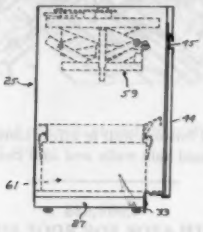
4,000,689
TRASH COMPACTOR

Charles B. Weeks, Boston, and Paul V. Choate, Milton, both of Mass., assignors to Norris Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 515,675, Oct. 17, 1974, abandoned. This application May 27, 1975, Ser. No. 580,579
Int. Cl.² B30B *1/18*
U.S. Cl. 100—229 A 9 Claims

1. A compactor for compacting trash in a bag, said trash compactor comprising a housing including supporting structure in its upper end, a base, and a door hingedly connected to one side thereof, a trash compacting head, and means operable to reciprocate said head between an upper inoperative position and lower compacting positions, said housing including an outwardly opening, trash-receiving throat located and dimensioned to receive said head and to define a subjacent chamber with the base at the bottom thereof, the lowermost position of the head being within the chamber, said throat

including side and rear walls spaced inwardly from the housing with the upper margin of each disposed towards and in contact with the corresponding wall of the housing, and bag holding means operable to hold a bag open to receive trash and to protect the bag while trash is being compacted therein, said bag holding means shaped and dimensioned to be slid into the chamber without contact with the walls thereof and to be supported by the base, said bag holding means including a bag receiving and supporting pan the side walls of which are of a



flexible and resilient material having a low coefficient of friction, and an open-ended container dimensioned to fit within a bag and be supported by said pan, said container including walls of a flexible resilient material extending above the pan and a frame of spring steel to which the upper ends of the walls are secured and which is dimensioned to be a free fit within said chamber and to underlie and be shielded by said throat, said throat capable of withstanding pressure attendant the compacting of trash if extending upwardly from the container into the throat.

4,000,690

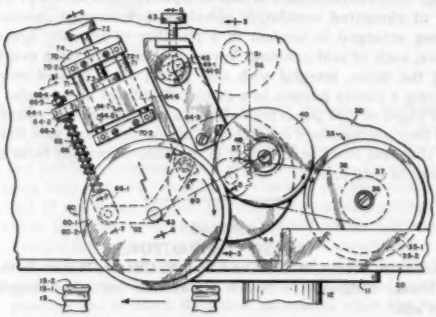
PRINTING CODER

Friedrich Henri Herman Geurtsen, Holliston, and Maurice Désiré Pichel, Milford, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed May 1, 1975, Ser. No. 573,725

Int. Cl.² B41F *17/00*

U.S. Cl. 101—36 **16 Claims**



1. In a coder for imprinting on containers or the like, said coder including a metering roll and a printing roll supported for rotation, and said metering roll providing ink to said print roll, characterized in the improvement of said print roll being free wheeling and being supported for rotation between the ends of a lever, said print roll supported on a center shaft and said center shaft is supported by said lever, one end of said lever being pivotally supported in a fixed position, the other end of said lever being resiliently biased to urge said print roll towards said metering roll and said print roll being raisable against said resilient biasing means away from said metering roll in which rod means is pivotally coupled to said resiliently biased end of said lever and in which the rod means is supported for sideway and vertical movement and, in which a block is supported by a support bracket, said block including an arm for pivotally supporting said lever and in which said rod means is positioned in a bore of said block.

4,000,691

ROTARY PRINTING PRESS WITH IMPROVED INKING SYSTEM

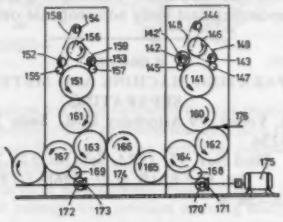
Hermann Fischer, Augsburg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany

Continuation of Ser. No. 441,747, Feb. 12, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,909

Claims priority, application Germany, Feb. 28, 1974, 2309850

Int. Cl.² B41F *31/00, 5/16*

U.S. Cl. 101—136 **9 Claims**



1. Rotary offset printing press having a drive motor (175) and a plurality of serially - in the direction of feed of the material to be printed - arranged printing systems, each printing system comprising

a plate cylinder (1, 31);

gear means (170′, 171, 168, 164, 162, 160, 141; 172 173, 169, 167, 163, 161, 151) driven by the motor (175) driving the plate cylinders (1, 31) of the systems;

a wetting system (23, 24);

an inking system including an ink supply (2,3; 32, 33) and an inking roller train having ink transport and application rollers for each system transporting ink from said supply to the plate cylinder including a driven ink supply friction roller (4,34) and ink friction roller drive means (145, 142, 148, 144; 155, 152, 158, 154) positively driving said driven ink friction roller independently of the plate cylinder,

at least one driven intermediate friction roller (6, 36) and intermediate friction roller drive means (147, 143, 149, 146; 157, 153, 159, 156) positively driving said at least one driven intermediate friction roller (6, 36),

and at least one ink application roller (11, 12, 13, 14, 15, 16; 41, 42, 43, 44, 45, 46) in frictional force-transmitting engagement with the plate cylinder (1), and drive means (147, 143, 145, 147; 152, 153, 155, 156) in engagement with the gear means (141, 151) driving the plate cylinders (1, 31),

wherein

the ink friction roller drive means driving said ink friction roller (41, 34) have a transmission ratio which drives the ink friction roller a. circumferential speed which is less than the circumferential speed of the plate cylinder (1);

the intermediate drive means driving said intermediate friction roller (6, 36) have a transmission ratio which drives the intermediate roller at the circumferential speed which is less than the circumferential speed of the plate cylinder (1) but higher than the circumferential speed of the ink friction roller (4, 34) so that the friction roller (4, 34) adjacent the ink supply has the lowest circumferential speed of said friction rollers to apply, by said friction rollers, a braking torque to the plate cylinder;

and wherein the friction roller (4, 34; 70, 80; 170, 180) of the serially arranged printing systems are driven by their

respective drive means at such relative speeds that the ink friction rollers downstream in the direction of feed of material have a speed which is less than that of the respective ink friction rollers of the printing system next adjacent thereto and located upstream with respect thereto.

4,000,692

THROW-OFF SYSTEM FOR ROTARY OFFSET PRINTING PRESS

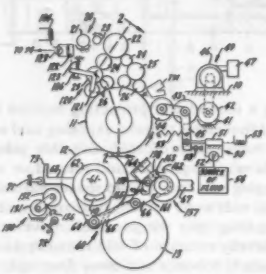
Burkhardt Wirz; Peter Decker, both of Munich; Valentin Gensheimer, Mulheim (Main), and Alfred Dorn, Offenbach (Main), all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Dec. 1, 1975, Ser. No. 636,375

Claims priority, application Germany, Dec. 3, 1974, 2456985

Int. Cl.² B41F 7/06, 7/40, 13/28, 31/30

U.S. Cl. 101—144 17 Claims



1. In a lithographic press, the combination comprising a press drive, a plate cylinder, blanket cylinder and impression cylinder, means including a series of ink feed rolls clutched to the press drive for applying a film of ink to the plate on the plate cylinder, a water feed system for applying a film of water to the plate on the plate cylinder, means for constantly monitoring the thickness of the water film and for producing an output signal in accordance therewith, the water feed system including a fountain and a water form roller with at least one water feed roller interposed therebetween, means for throwing off the blanket cylinder to interrupt normal printing, first flow control means in the form of means responsive to the monitoring means for correctively adjusting the fountain to control the rate of water feed to the form roller and plate during normal printing, the fountain being sufficiently upstream in the water feed path so that there is a delay between the making of an adjustment at the fountain and a resulting change in film thickkness at the plate, second water flow control means in the form of means responsive to the monitoring means for cyclically engaging and disengaging the water form roller from the plate to control the feeding of water to the plate, means operated incident to throw-off of the blanket cylinder for energizing the second flow control means, with the relatively rapid response of the second flow control means as compared to the first flow control means serving to promptly limit and maintain a film of predetermined thickness on the plate, means operated incident to throw-off of the blanket cylinder for declutching the ink feed rolls, and means operated incident to reengagement of the blanket cylinder for disabling the second flow control means and for reclutching the ink feed rolls.

4,000,693

SAFE ACCESS ARRANGEMENT FOR DRIVEN MECHANISMS IN A PRINTING PRESS

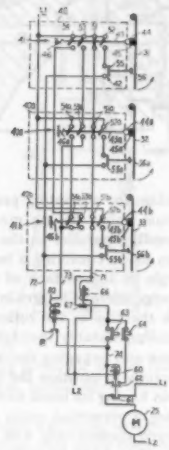
Werner Kaiser, Offenbach-Rumpenheim, and Paul Abendroth, Offenbach (Main), both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed June 23, 1975, Ser. No. 589,009

Claims priority, application Germany, June 26, 1974, 2430536

Int. Cl.² B41F 33/12

U.S. Cl. 101—183 10 Claims



1. In a printing press having a drive motor and remotely located driven mechanisms as well as a main switch for the drive motor, the combination comprising access covers for safely covering the driven mechanisms but removable to provide access for servicing and adjustment, remote control modules located under the respective access covers, each remote control module having a motor remote control switch including an enabling circuit exclusive of said main switch and effective to energize the drive motor, each remote control module further having a shiftable interlock switch, said interlock switch being mechanically coupled to the associated access cover for movement from a normal position when the cover is closed to a shifted position when the cover is open, means including a motor disabling relay having a normally closed contact effectively connected in series with the motor so the motor is disabled when the relay is energized, the interlock switches each including first and second contact means for shifting control of said motor from said main switch to said means including said motor disabling relay when a single cover is open, said first contact means effectively in series with the main switch for disabling the main switch when the associated cover is open, said second contact means connected to the associated motor remote control switch for enabling the latter when the associated cover is open, said interlock switches further including contacts connected in paired relation with corresponding contacts on each of the other ones of the interlock switches for energizing the motor disabling relay so that the motor is disabled whenever two or more covers are open simultaneously.

4,000,694

INK FOUNTAIN IN AN INKING SYSTEM FOR PRINTING PRESSES

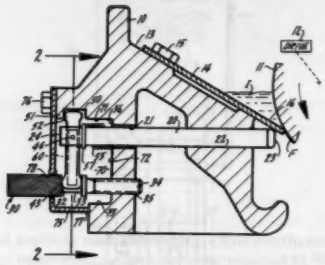
Peter Schroder, Offenbach, Main, Germany, assignor to Roland Offsetmaschinenfabrik Faber Schleicher AG, Germany

Filed June 26, 1975, Ser. No. 590,846

Claims priority, application Germany, June 26, 1974, 2430643

Int. Cl.² B41F 31/04

U.S. Cl. 101—365 7 Claims



1. In an ink fountain for a printing press, the combination comprising a fountain roller having means for rotating the same, a frame extending parallel to the fountain roller and mounting a fountain blade confining a body of ink, the blade extending at an angle to the surface of the roller and (with the) having a free edge thereof in proximity to the surface to define a film of ink thereon as the roller rotates, a series of adjusting pins extending slidably through registering parallel openings in the frame and engaging the free edge of the blade at spaced points thereby to position the blade with respect to the surface, each pin having its inner end in engagement with the blade and having a presented outer end, a vertically extending lever arranged transversely with respect to each pin, with the central portion of the lever being connected to the presented outer end of the pin, a manually rotatable key for each pin threaded with respect to the frame along an axis parallel to the pin and laterally spaced from the pin, an abutting surface on the frame adjacent one end of the lever to provide a fulcrum, the other end of the lever being engaged by the key, and a return spring for urging the pin outwardly with respect to the frame so that when the key is rotated the lever rocks about its fulcrum to move the pin inwardly against the blade with positive action against the restoring force of the return spring, each lever and associated pin being manually rotatable as a unit about the pin axis for simultaneous disengagement of the one end of the lever from the abutting surface on the frame and disengagement of the other end from the associated key thereby to permit withdrawal of the lever and pin for purposes of cleaning and maintenance while leaving the key in adjusted condition.

4,000,695

INK FOUNTAIN BLADE ASSEMBLY

Frank Perretta, Aux. Rte. 2, Marlboro, N.Y. 12542

Filed Oct. 16, 1975, Ser. No. 622,871

Int. Cl.² B41F 31/02

U.S. Cl. 101—365 5 Claims

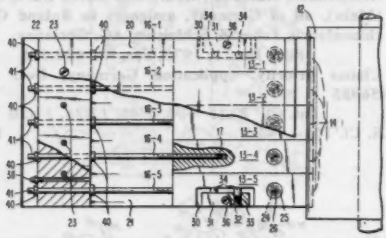
1. An ink fountain blade assembly adapted to be detachably mounted in a printing press for regulating the flow of ink onto a roller, said assembly having a generally flat rectangular shape and being bounded by flat parallel rectangular upper and lower surfaces, front and back edges and lateral sides, said assembly comprising:

first and second flat, rigid rectangular plates forming said upper and lower surface having forward and rearward edges;

a spacer bar fixedly attached between said plates along said plate rearward edges running along said back edge of said assembly and spacing said plates in a parallel relationship;

a plurality of rigid ink blades slidably mounted between said plates in an abutting, side-by-side, sliding relationship with each other, said blades having first and second ends, said first ends projecting beyond said forward edges of said plates and being spaced relatively close to said plates to retard the flow of ink into said assembly, said first blade ends being aligned for engagement with said roller and extending along said front edge of said assembly, said blades having arcuate faces conforming to the curvature of said roller, said blades having thicknesses slightly less than the distance between said plates allowing sliding movement of said blades between said plates;

a plurality of rotatable rods extending through said spacer bar and between said plates, each of said rods having a first end threadedly attached to a different one of said blades at said second end thereof, each of said rods further having a second end projecting beyond said spacer bar and said first edges thereby exposing said second ends along said back edge of said assembly whereby such second ends may be grasped and rotated;



means connecting said rods to said spacer bar and operative to allow said rods to be rotated relative to said spacer bar while preventing any longitudinal movement relative thereto, whereby rotation of said rods causes said blades to move linearly towards and away from said roller such that the positions of said blades are selectively adjustable relative to said roller in response to selective rotation of said rods; and,

spacer means fixedly connected between said plates adjacent to said forward edges and operative to hold said plates in a rigid fixed spaced relationship along said forward edge while allowing movement of said blades between said plates means mounted adjacent said sides of said assembly for resiliently biasing said blades against each other.

4,000,696

CARTRIDGE FOR TWO COMPONENT FIELD MIXED EXPLOSIVE

James E. Friant; William J. Bruton, both of Renton; Viggo C. Bertelsen, Jr., Bellevue, all of Wash., and Patrick A. Yates, Ridgecrest, Calif., assignors to Excoa, Inc., Redmond, Wash.

Filed Sept. 5, 1975, Ser. No. 610,674

Int. Cl.² F42B 3/02

U.S. Cl. 102—24 R 7 Claims

1. An explosive cartridge particularly adaptable to a field mix two component explosive composition, which cartridge is arranged to be coupled with other like cartridges to form an explosive column train by end to end coupling of the cartridges, said cartridge comprising:

a. a cylindrical containing shell to contain a first solid component of said explosive composition, said shell having:

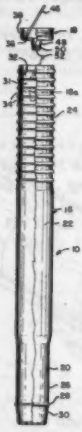
1. an open tail end portion defining a substantially nontapering cylindrical recess,

2. a closed front nose portion having a substantially nontapering cylindrical outer surface portion adapted to

slide axially into a tail end portion of an adjacent forwardly located cartridge,

3. said end portions being provided with circumferential matching ridge and groove means to provide mechanical interconnection of a pair of adjacent cartridges,

b. a cylindrical end closure plug adapted to fit within the non-tapering recess of its related cartridge in sealing relationship therewith, and moveable axially in snug sliding relationship a substantial axial length of the tail portion of its related shell from a rearward pre-mix position to a forward post-mix position,



c. said plug and tail end having non-matching ridge and groove means so as to provide a mechanical interconnection therebetween by at least one engaging ridge and groove, and providing a seal therebetween by means of a non-matching portion of the ridge and groove means,

whereby said plug and shell form a watertight seal in both post-mix and pre-mix conditions, and said plug can be moved axially in said shell while maintaining a proper seal to accomodate post-mix slump of the explosive composition.

4,000,697

MECHANICAL RETENTION SYSTEM FOR USE WITH CASELESS AMMUNITION

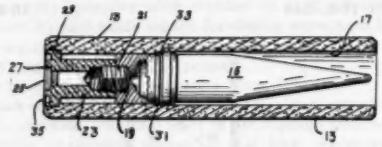
Seymour Levine, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 10, 1972, Ser. No. 279,415

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² F42B *5/02*

U.S. Cl. 102—38 **3 Claims**



1. A telescoped round of caseless ammunition comprising, a propellant charge of substantially cylindrical configuration and having an axial bore therethrough, said propellant charge having a forward portion and a rearward portion,

a projectile positioned in the forward portion of and completely within the bore of said propellant charge,

a tubular igniter positioned in the rearward portion of said propellant charge immediately aft of said projectile,

means for threadably connecting said tubular igniter to the base of said projectile, and

a primer disposed within the rearwardmost portion of said igniter, said primer being in operative engagement with a shoulder on said igniter to support and effectively prevent forward movement of said primer upon firing pin impact.

4,000,698

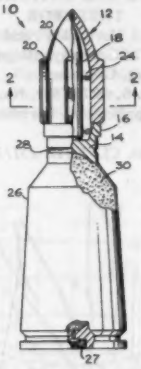
SELF-SEPARATING SABOT

Martin Corney, Glendora, Calif., assignor to General Dynamics Corporation Pomona Division, Pomona, Calif.

Filed Oct. 29, 1974, Ser. No. 518,689

Int. Cl.² F42B *13/16*

U.S. Cl. 102—93 **7 Claims**



1. A self-separating sabot for use in launching a projectile from launching means, including:

a base portion;

a frangible sabot body enclosing said projectile and secured to said base portion, said sabot body having a longitudinal axis therein; and

mechanical application pressure means projecting from the outer surface of said sabot body, said frangible sabot body being responsive to said mechanical application pressure means to generate fracturing stresses within said sabot body.

4,000,699

APPARATUS FOR REPLACEMENT OF RAIL TRACKS

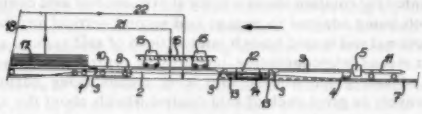
Frédy Scheuchzer, Lausanne; Fritz Bühler, Ecublens, and Alfred Chiesa, Lucerne, all of Switzerland, assignors to Les Fils d'Auguste Scheuchzer S.A., Switzerland

Filed Jan. 24, 1975, Ser. No. 543,863

Claims priority, application Switzerland, Jan. 29, 1974, 1158/74; May 27, 1974, 7207/74

Int. Cl.² E01B *29/02*

U.S. Cl. 104—2 **11 Claims**



1. An apparatus for replacement of an old rail track disposed on an underlying bed surface by a new rail track, comprising a train assembly including a first train section having means for moving on old rail track, a second train section having means for moving on a new rail track, an intermediate train section linking the first and second train sections, means for removing panels of the old track from the bed surface, means for laying new cross-ties on the bed surface cleared of the old track to support rails of a new track, and means for

placing and securing new rail sections longer than said removed track rails on said new cross-ties to form the new track, said intermediate train section comprising an open-frame wagon having means defining therein an opening through which said track panels can be lifted, said intermediate train section having an undercarriage including a retractable bogie able to run on the old rail track and auxiliary support means for supporting the intermediate train section at least indirectly on the underlying bed surface independently of the old track and of the secured new track during movement of said intermediate train section over parts of said bed surface from which panels of the old track have been removed.

4,000,700

RAILWAY VEHICLE AND SWITCHING MECHANISM THEREFOR

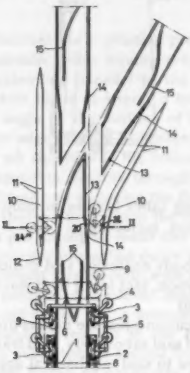
Hans-Otto Hannover, Herdecke, and Johannes Gerhard Spöler, Hagen, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed Mar. 6, 1975, Ser. No. 556,004

Claims priority, application Germany, Mar. 12, 1974, 2411686

Int. Cl.² E01B 25/12

U.S. Cl. 104—130 5 Claims



1. In a railway system comprising a support for said system, said support including horizontal main rail surfaces, first vertical main guide rail surfaces and second vertical surfaces being on an auxiliary rail disposed adjacent branch intersections of said system; at least one vehicle mounting traction wheels on opposite sides thereof adjacent each corner for rotation about horizontal axes and mounting guide wheels on opposite sides thereof adjacent each corner for rotation about vertical axes; said traction wheels being adapted to engage said horizontal main rail surfaces for propulsion of said vehicle therealong, and said guide wheels being adapted to engage said first vertical main guide rail surfaces for guiding said vehicle; a control wheel pivoted on the axis of each of said guide wheels and mounted for rotation about a vertical axis, each of said control wheels being adapted to engage said second vertical auxiliary directional rail in said branch intersections of said system; and lever means interconnecting each of said control wheels with one of said guide wheels, said lever means being adapted selectively to pivot each of said control wheels about the axis of one of said guide wheels for selective engagement with said second vertical auxiliary directional rail; the improvement comrising

a. said second vertical auxiliary directional rail having a vertical auxiliary directonal engaging surface on each side thereof,

b. each guide wheel and its associated control wheel on one side of said vehicle engages one side of said auxiliary vertical directional rail in opposed relation in said branch intersections of said system and

c. said first vertical main rail guide surfaces being recessed on the side of said support opposite said opposed second vertical surfaces whereby said guide wheels on that side are spaced from said first vertical surfaces in said branch intersections.

4,000,701

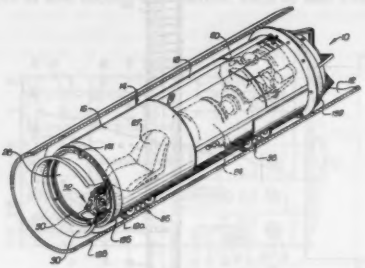
MANNED WELDING AND INSPECTION VEHICLE

John T. Ostgaard, 7855 Vicksburg Ave., Los Angeles, Calif. 90045; James M. Doornbos, 412 S. Locust, Compton, Calif. 90221; John E. Bartley, 216 Lake Drive, Aptos, Calif. 95003, and Cor de Lange, Yacht Haven, Berth 202, Wilmington, Calif. 90744

Filed July 3, 1975, Ser. No. 592,984

Int. Cl.² B65G 51/04

U.S. Cl. 104—138 R 26 Claims



1. A manned welding and inspection vehicle for movement through the interior of large-diameter pipes for welding said pipes end to end quickly and efficiently, said vehicle comprising:

a frame;

a housing extending about said frame;

a power source mounted to said frame and located within said housing at a rearward portion thereof; .

a generator coupled to said power source within said housing;

an operator's chamber located within said housing at a forward portion thereof;

a welding system, a portion of which is connected to said housing at the forward end thereof in front of said operator's chamber; and

a driving system connected to said housing for moving said vehicle through said pipes.

4,000,702

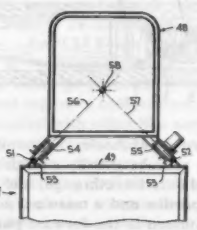
TRANSPORTATION SYSTEM

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed July 24, 1975, Ser. No. 598,875

Int. Cl.² B61B 12/02

U.S. Cl. 104—244 20 Claims



1. In a transportation system, comprising:

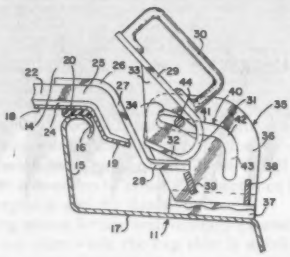
an elongated track having a pair of rails mounted thereon, said rails being spaced apart transversely of said track, in combination with an elongated car adapted for travel along said track, first and second wheel means mounted along a side of said car and respectively engaging said rails, said first and second wheel means including a plurality of first and second wheels respectively lying in planes intersecting at the center of gravity of said car, said first and second wheel means being spaced apart a distance of at least one-half said side of said car, said wheels of said respective wheel means thereby being parallel to the resultants of force acting on said rails while said car travels along other than straight paths, whereby direct stresses on said wheels of one of said wheel means increases while direct stresses on said wheels of the other of said wheel means decreases during travel of said car along other than straight paths.

4,000,703

TROUGH HATCH LOCKING DEVICE

William R. Halliar, Whiting, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed June 11, 1975, Ser. No. 585,985
Int. Cl.[2] B61D *39/00*
U.S. Cl. 105—377 9 Claims



1. A hopper hatch structure including a roof having a coaming defining a hatch opening,

a hatch cover hingedly connected to said roof for movement between open and closed positions relative to said opening,

a hold down arm supported on said roof including portions engaging said hatch cover in said closed position,

said hold down arm having a locking portion extension projecting horizontally outwardly relative to said coaming in the engaging position of said arm, the improvement comprising,

a latch mechanism releasably locking said hatch cover in the closed position including,

latch support means mounted on said roof to one side of said coaming including,

an upstanding pedestal having guide means thereon,

a manually operative latch member on said pedestal confined by said guide means for sliding movement from a lowered non-operative position longitudinally outwardly of said arm to a locking position,

said latch member comprising a lever,

a latch element connected to said lever and extending co-directionally with said lever in overlapping relation,

operator engageable means on said lever whereupon an operator may move said latch member from said non-operative position slidingly along said guide means upwardly and inwardly over said locking extension, said latch element including means initially engaging and forcing said extension downwardly,

said latch member being thereupon rotatable on said guide means whereupon said latch element engages said extension in locking relation and said lever overlies said hold down arm, and

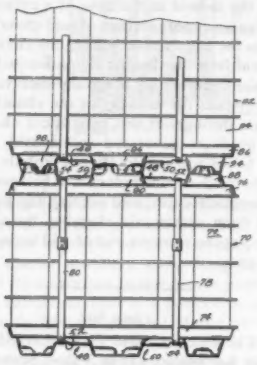
said means initially engaging said extension during locking movement of said latch member including an arcuate cam portion connecting said latch element to said lever.

4,000,704

SHIPPING PALLET

Charles E. Griffin, Jr., High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 18, 1974, Ser. No. 516,202
Int. Cl.[2] B65D *19/38, 21/02*
U.S. Cl. 108—53.1 4 Claims



4. A shipping container for securing and transporting a load, said container comprising identical top and bottom shipping pallets and strapping means for securing the top and bottom pallets to said load wherein each said top and bottom pallet comprises a generally planar deck having an upwardly extending exterior wall portion, said wall portion being adapted to locate said load, a network of reinforcing rib members extending away from said deck, a first portion of said reinforcing rib members defining at least two channels within said pallet adapted to permit entry of the forks of a lift truck under said pallet, a plurality of foot means extending away from said first portion for supporting said pallet, each of said foot means having complimentary suporting surfaces formed from a second portion of reinforcing rib members comprising a plurality of alternating male and female sections within each said foot means, wherein said supporting surfaces are formed into an interlocking herringbone pattern substantially across the entire area of said surfaces, said male and female sections being located in planes other than the plane of said deck, said male sections in said bottom pallet providing support for said container when not in a stacked orientation, said male and female sections of said top pallet being adapted to interlock with complimentary foot means of an inverted similarly designed pallet comprising the bottom pallet of a second container when the second container is placed in a stacked orientation on the first container whereby the mating surfaces of the male and female sections provide substantially the sole supporting surfaces between the containers and prevent lateral shifting of the containers when in that stacked orientation.

4,000,705

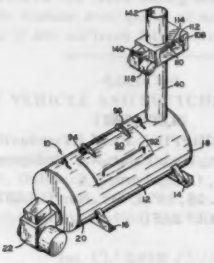
PROCESS FOR DISPOSING OF ANIMAL CARCASSES

J. Wayne Raber, Huntington, Ind., assignor to Phillip Kaehr, Decatur, Ind., a part interest

Continuation of Ser. No. 494,079, Aug. 2, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 623,949

Int. Cl.² F23G *1/00*

U.S. Cl. 110—3 **12 Claims**



1. A process for burning dead animals comprising the steps of: disposing the animal at the base of a cylindrical chamber with a curvilinear support surface of said chamber providing a resting surface for said animal, heating the chamber and therefore the animal from the burner flame located at one end of said cylindrical chamber by a spirally directed flame which substantially engulfs the entirety of the chamber, circulating the heated air throughout the cylindrical chamber and the combustion products generated within said chamber for a period of up to 0.8 seconds to effect pyrolytic decomposition of the organic product and reduce the balance of the animal product to irreducible ash, and venting the gaseous combustion product from within said chamber through a ventilator stack disposed at the extreme end of said incinerator remotely from said burner.

4,000,706

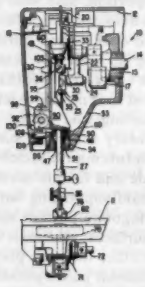
SKIP STITCH MECHANISM FOR SEWING MACHINES

Ernst Kreissl, Karlsruhe; Erwin Vahle, Stutensee, and Hans Uhlig, Karlsruhe, all of Germany, assignors to The Singer Company, Elizabeth, N.J.

Filed May 6, 1976, Ser. No. 683,866

Int. Cl.² D05B *55/16*

U.S. Cl. 112—221 **7 Claims**



1. A skip stitch mechanism in a sewing machine having a frame, a needle bar, means supporting said needle bar for endwise reciprocation in said frame, a latch mechanism carried on said needle bar, actuating means for imparting forces through said latch mechanism for reciprocating said needle bar endwise, unlatching means supported by said means supporting said needle bar and selectively movable about said supporting means to a first position into cooperative relation with said latch mechanism to disconnect said needle bar from said means for imparting endwise reciprocation to said needle bar and to a second position out of cooperative relation with said latch mechanism, and actuating means for moving said unlatching means selectively to said first and second positions.

4,000,707

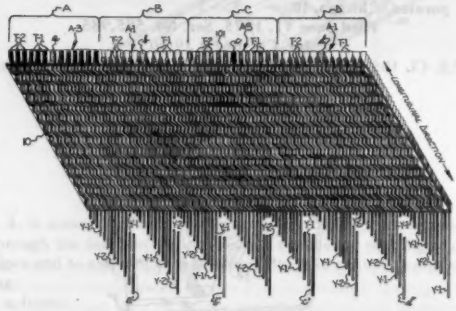
TUFTED PILE FABRIC AND METHOD OF MAKING SAME

Peter R. Spirer, Coral Gables, Fla., assignor to Horizon Industries, Inc., Dalton, Ga.

Filed Dec. 16, 1974, Ser. No. 532,766

Int. Cl.² D05C *17/02*

U.S. Cl. 112—410 **14 Claims**



1. A tufted pile fabric having groups of longitudinally extending zig-zag rows of yarn pile tufts disposed in parallel relation to each other, each group of rows comprising a plurality of alternate and intervening rows of pile tufts and defining longitudinally arranged pile areas, with the pile areas presenting different color and pattern effects within each group and among the various groups, substantially all the yarns being high bulk space dyed yarns having varying color characteristics along their length and wherein the pile yarns of alternate rows of pile tufts in each group have color characteristics differing from substantially all of the pile yarns of intervening rows therein, substantially all the intervening rows of pile tufts in at least one of the groups in each pattern repeat being of color characteristics differing from substantially all the intervening rows of pile tufts in the other groups of the pattern repeat, said pile areas being of different types and including

a. a first pile area having high cut pile tufts in the alternate rows and low pile tufts in the intervening rows such that the high cut pile tufts substantially conceal the low pile tufts,

b. a second pile area having high cut pile tufts in the intervening rows and low pile tufts in the alternate rows such that the high cut pile tufts substantially conceal the low pile tufts, and

c. a third pile area having cut pile tufts in alternate and intervening rows of substantially common height, and said first, second and third pile areas being arranged

in a predetermined pattern of visually distinct areas within each group and among the various groups, and wherein the pattern arrangment of said different types of pile areas of certain groups is different from that of other groups to present different color and pattern effects as well as different types of said pile areas both longitudinally and transversely of the pile fabric.

4,000,708

APPARATUS FOR CAPPING RECEPTACLES

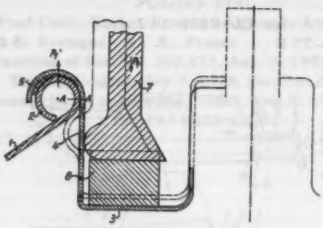
Jean Hardt, Neuhausen am Rheinfall, Switzerland, assignor to Aluminium Suisse S.A., Switzerland

Continuation of Ser. No. 252,896, May 12, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,283

Claims priority, application Switzerland, May 17, 1971, 7247/71

Int. Cl.² B21D *37/00, 51/26*

U.S. Cl. 113—18 R 10 Claims



1. A swaging device for securing a cup-shaped metal cap having a skirt, a bottom and an outwardly projecting circumferential flange about a mouth thereof to a receptacle having a conically converging neck at one end and having an opening defined by an edge of said receptacle provided in said neck for receiving said cap, said swaging device comprising:

a. loading means for axially stressing said skirt when the cup-shaped metal cap is disposed in the mouth of a receptacle with the skirt extending into the receptacle and the flange disposed on the edge defining the receptacle opening thereby developing stresses in the flange to stress the flange in a direction to effect a seal between the mouth of the receptacle and the flange; and

b. clinching means for circumferentially extending a portion of the cap skirt while the cap skirt is axially stressed to form by plastic deformation a circumferential bulge therein permanently set to secure the cap to the converging neck of the receptacle and permanently maintain the flange in a stressed condition to form a permanent seal between the flange and the mouth of the receptacle, said clinching means comprising a plurality of radially displaceable clinching jaws symmetrically disposed about a common axis, each of said clinching jaws being provided with a bulged portion on an outer surface thereof for forming said circumferential bulge on said cap skirt when said jaws are radially outwardly displaced, said plurality of jaws having an outer diameter in a region opposite said flange of said cup less than an inner diameter of said cup when said clinching jaws are outwardly displaced so that said clinching jaws do not contact said flange or said cup skirt in an area around said flange, and means for radially displacing said clinching jaws outwardly for forming said circumferential bulge and inwardly for releasing said cap skirt from said clinching jaws.

4,000,709

CAROUSEL CAN END FEED UNIT

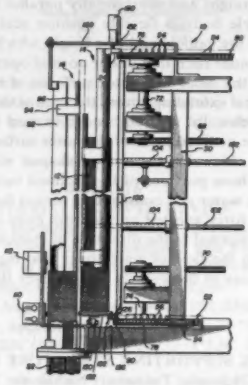
Wallace W. Mojden, Hinsdale, Ill., assignor to Fleetwood Systems, Inc., Countryside, Ill.

Filed July 3, 1975, Ser. No. 593,030

Int. Cl.² B21D *43/12*

U.S. Cl. 113—114 BG 4 Claims

1. Apparatus for supplying can ends and the like, comprising a frame, endless upper and lower multi-link, roller drive chains mounted for cyclic motion on the frame, drive means for driving the upper and lower roller chains, a plurality of carrier members for supporting a stack of can ends or the like, carried by said roller chains, and ejector means for transferring a stack of ends from said carrier member to a receiving station, an improved mounting arrangement for said carrier members, comprising releasable interconnector means for connecting each carrier member to the upper and lower roller drive chains, which interconnector means includes first and second spaced extensions on each carrier member extending toward the respectively adjacent upper and lower roller chains, and vertically projecting pin means on said roller chains, said first and second extensions providing aperture means receiving said pin means to attach the carrier members to the roller chains for motion therewith, said interconnecting



means enabling the positions of the carrier members on the chain to be altered and also providing for ease in the interchanging of carrier members of different size; and support means for said carrier members, comprising an upper, substantially planar frame surface, roller means journalled to the bottom of each carrier member in a position to roll over said frame surface to facilitate movement of said carrier member about the apparatus frame and to support the carrier members and any can ends carried therein so that the weight of said carrier members and can ends need not be supported by said drive structure or said interconnector means.

4,000,710

AIR CUSHION VEHICLES

William Arthur Crago, Cowes, England, assignor to British Hovercraft Corporation Limited, Yeovil, England

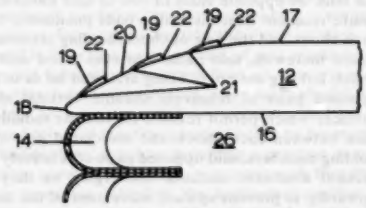
Filed July 18, 1974, Ser. No. 489,550

Claims priority, application United Kingdom, July 19, 1973, 34462/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B60V *1/04*

U.S. Cl. 114—67 A 5 Claims



1. An air cushion vehicle for travelling over water and which, in operation, is supported above the water, at least in

part, by a cushion of pressurised air formed beneath the vehicle body, the sides of the cushion being contained by a pair of rigid sidewall structures rigid with the vehicle body and extending longitudinally along the sides of the vehicle body and depending downwardly therefrom so as to dip into the water to a depth such that under normal operation they are always immersed in the water and provide a cushion seal along the sides of the vehicle, each sidewall having inner and outer surfaces with respect to the cushion, the outer surface inclining inwardly when viewed in plan to meet with the inner surface thereof at the forward end of each sidewall, said inner surface at the forward end, when viewed in plan, being substantially straight and substantially parallel to the center line of the vehicle body, a flexible cushion seal extending across the front of the vehicle and of a height which permits water to flow thereunder such that under normal operation water flows along both the inner and outer surfaces of each sidewall, and a cushion seal extending across the rear of the vehicle between said rigid sidewalls, wherein wedge shaped members are provided on the inclined parts of the outer surfaces at the forward end of the sidewalls, the wedge shaped members being arranged on those portions of the inclined outer surfaces which dip into the water and constituting means for reducing the net differential force exerted on the front ends of each sidewall in a direction normal to the direction of motion of the vehicle by breaking up the flow of water over said inclined parts of the outer surfaces as the vehicle travels over the water.

4,000,711

TANK SUPPORTING STRUCTURE FOR SHIPS

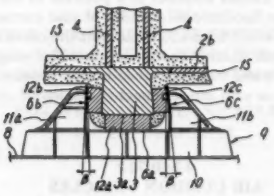
Tomiyasu Okamoto; Tsunanori Nishimoto; Koji Harada, and Seiichiro Murata, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed Apr. 16, 1975, Ser. No. 568,628

Claims priority, application Japan, Apr. 19, 1974, 49-44693; Apr. 19, 1974, 49-44694

Int. Cl.² B63B *25/08*

U.S. Cl. 114—74 A **5 Claims**



1. Structure for supporting a tank on a support deck of a ship comprising:

a plurality of chocks secured to the tank and spaced apart from each other around the outer periphery of the tank adjacent said support deck;

a plurality of pairs of opposed chock holding members mounted on said tank support deck, each pair of said chock holding members being disposed peripherally of the tank on opposite sides of one of said chocks;

pressure resistant heat insulating pads positioned between each chock and the pair of chock holding members associated therewith, said pads, said chock and said pair of chock holding members being arranged so as to provide opposed pairs of relatively slidable vertical abutment surfaces which permit relative movement radially of the tank between each chock and associated pair of chock holding members, said opposed pairs of relatively slidable vertical abutment surfaces converging as they extend upwardly to prevent upward movement of the tank relative to the support deck; and

means disposed between the outer periphery of the tank and said tank support deck for supporting vertical loads on the tank by abutting horizontal surfaces which permit relative sliding movement between the tank and the tank support deck.

4,000,712

BOAT HULL CONSTRUCTION

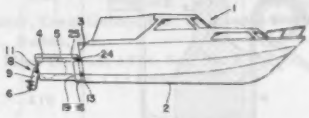
Ernst G. Erikson, and K. Hakan Lindström, both of Kvarngatan 8, 931 00 Skellefteå, Sweden

Filed Sept. 23, 1975, Ser. No. 615,963

Claims priority, application Sweden, Sept. 23, 1974, 7411901

Int. Cl.² B63B *3/02, 1/38*

U.S. Cl. 114—77 R **5 Claims**



1. In a boat with propulsion machinery and a boat hull construction comprising a main hull defined by bottom and side walls, an additional hull attached to the stern of the main hull, and means for adjusting the additional hull relative to the main hull, said additional hull having located therein the propulsion machinery, the main hull being provided with an extension member which is in overlapping relationship with the additional hull thereby to provide an air space between the two hulls and below an initial forward portion of the additional hull, the improvement comprising as said extension member, a member extending rearwardly from the main hull in the same plane as the bottom and side walls of the main hull so as to extend in a continuum in overlapping relationship with the additional hull, and as said means for adjusting the additional hull relative to the main hull, means for pivoting said additional hull about a fixed horizontal and transverse axis with respect to said main hull during operation of the boat.

4,000,713

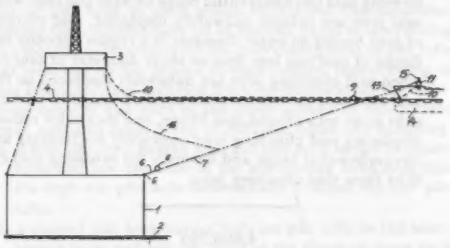
COMBINED MOORING AND TRANSFER MEANS FOR OIL AND OTHER LIQUID

Sigurd Heien, Aslokkveien 82, 1362 Billingstad, Norway

Filed May 1, 1975, Ser. No. 573,618

Int. Cl.² B63B *21/00*

U.S. Cl. 114—294 **4 Claims**



1. Combined mooring and transfer means for oil and other liquid which is to be transferred to a ship from an off-shore production platform, storage tank, pipeline and other installation which rests on the sea bed and partly extends above sea level, comprising a floating mooring hawser which may be hauled toward that part of the installation which extends above sea level and a floating hose which may be hauled aboard that part of the installation which extends above sea level, wherein the one end of the mooring hawser is connected to that part of the installation which rests on the sea bed and the other end is connected to a buoy which also is connected

to the transfer hose, said buoy having a hanger on the underside for support of that end of the transfer hose which is to be connected to the ship, one end of the transfer hose being connected to that part of the installation which extends above sea level, and means for hauling said mooring hawser toward that part of the installation which extends above sea level.

4,000,714

SYSTEM FOR INTERCONNECTING A BARGE AND A PUSHER TUG

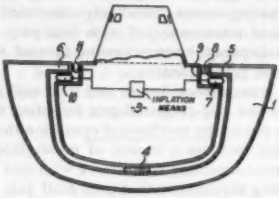
Jean Paul Colin, Nantes, France, assignor to Ateliers et Chantiers de Bretagne - A.C.B., France

Continuation of Ser. No. 385,577, Aug. 3, 1973, abandoned. This application May 7, 1975, Ser. No. 575,234

Claims priority, application France, Aug. 9, 1972, 72.28708

Int. Cl.² B63B *21/56*

U.S. Cl. 114—248 **14 Claims**



14. The method of interconnecting a barge and a pusher tug, said barge having a recess in the stern thereof to which the bow of said pusher tug conforms with clearance when the tug and barge are brought together, said method comprising the steps of

positioning said pusher tug within the recess in the stern of said barge with clearance between said tug and barge,

attaching one end of a rigid thrust transmitting passive member to said tug and the other end of said member to the stern of said barge, and

inflating inflatable means fixed in position within the clearance between said tug and said barge, said rigid thrust transmitting passive member transmitting forces directed along the longitudinal axis of the combined barge and pusher tug but not being subjected to any component of the forces substantially at right-angles to said longitudinal axis, and said inflatable means when inflated exerting forces at right-angles to the major surfaces of said pusher tug and barge, said thrust transmitting member and inflated inflatable means maintaining said pusher tug and barge interconnected to one another as they move.

4,000,715

ACOUSTIC ALARM DEVICE WITH SOUND ATTENUATOR

Bertrand A. Warnod, Courbevoie, France, assignor to Klaxon, France

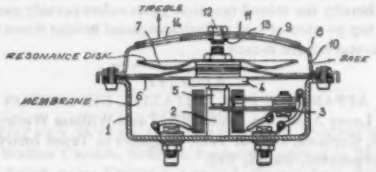
Filed May 29, 1975, Ser. No. 583,542

Claims priority, application France, May 31, 1974, 74.18951

Int. Cl.² G10K *9/22, 1/062*

U.S. Cl. 116—137 R **1 Claim**

1. An electromagnetic acoustic alarm device of the resonance disk type having a membrane comprising, in combination, a case, a bell-shaped rigid wall having a front portion and a side case in enclosing relationship with the membrane and the resonance disk with the membrane and said bell-shaped wall defining a chamber, said wall front portion having at least one opening, a shutter plate of a configuration matching that of said wall front portion rotatably mounted in overlying relationship with the outer surface of said wall front portion, said shutter plate having at least one opening and being movable between a plurality of selected rotary positions to position said shutter plate opening in uncovering relationship with said wall opening to a selected extent and a covering position with said wall front portion opening with respect to detent-positioning means on the shutter plate to thereby adjustably



attenuate the treble sounds generated by the resonance disk, said detent-positioning means having coacting means on said shutter plate and said wall front portion for indexing the selected rotary position of said shutter plate.

4,000,716

EPITAXIAL GROWTH DEVICE

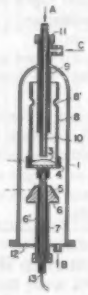
Kazuhiro Kurata, Hachioji; Kozi Honma; Masahiko Ogirima, both of Tokyo; Yuichi Ono, Kokubungi, and Yoshiteru Keikoin, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics Co., Ltd., both of, Japan

Filed Aug. 12, 1971, Ser. No. 171,250

Claims priority, application Japan, Aug. 12, 1970, 45-70073

Int. Cl.² B05C *11/00;* **B01J** *17/32;* **C23C** *13/08*

U.S. Cl. 118—5 **17 Claims**



1. An epitaxial growth device for making either a IIIb–Vb group compound semiconductor or a mixed crystal semiconductor of Group IIIb–Vb, comprising:

a substantially vertically supported reaction tube;

a crucible-shaped cylindrical metal holder disposed in said reaction tube and having a vertical axial length extending in said reaction tube;

means for maintaining a substantially isothermal temperature distribution in said reaction tube along the vertical axial extension of said cylindrical metal holder, wherein metal contained in a lower portion of said metal holder is in a fused condition, and for establishing a temperature gradient from approximately the lower portion of said metal holder to a lower portion of said reaction tube;

gas guide tube means inserted from an upper part of said reaction tube and extending inside said cylindrical metal holder to near the metal contained by said holder for introducing all reaction gases adjacent to the metal, said cylindrical metal holder providing a reaction zone and a mixing zone for all the reaction gases such that the reaction gases are mixed in the isothermal portion of the reaction tube inside said cylindrical metal holder, wherein said cylinder and guide tube means are coextensive with one another over a substantial part of the axial length of the reaction tube; and

wherein said substantial part approximates at least one half of the axial length of the reaction tube;

substrate crystal holder means disposed below said cylindrical metal holder in said lower portion of said reaction tube; and

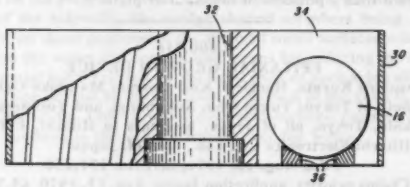
means for causing gas to flow past said crystal holder means, whereby the mixed reaction gases subsequently pass over a top portion of said cylindrical metal holder down to said crystal holder means.

4,000,717

APPARATUS FOR EPITAXIAL DEPOSITION

Philip Leroy Anderson, Richardson, and William Wesley Gartman, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1974, Ser. No. 531,933
Int. Cl.² C23C *13/08*
U.S. Cl. 118—49 **12 Claims**



1. Apparatus for epitaxial deposition wherein the epitaxial layer is prepared by chemical vapor deposition or by physcial vapor deposition which comprises:

a. a vertical reaction chember;

b. carrousel horizontally disposed in said reaction chamber;

c. means to pass gases through said carrousel; and

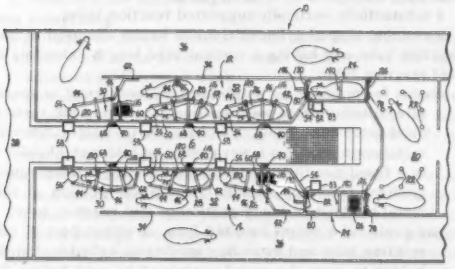
d. said carrousel comprising a central region, a plurality of walls extending radially outward from said central region said walls being slightly inclined from the vertical for positioning each slice at a slight angle with respect to the direction of gas flow, and means to support slices between a pair of adjacent walls.

4,000,718

PNEUMATIC AUTOMATED MILKING PARLOR

Michael J. Brown, 9955 9¼ Ave., Hanford, Calif. 93230

Filed Apr. 14, 1975, Ser. No. 567,727
Int. Cl.² A01J *7/00*
U.S. Cl. 119—14.03 **21 Claims**



1. An automated milking parlor comprising:

a barn having a pair of milk stall banks disposed in spaced parallel relationship, each with an entry end and an exit end, and an operator's pit disposed between said banks;

a plurality of milk stalls in each of said stall banks, said milk stalls in each bank being disposed to align cows positioned therein in head to tail alignment parallel to and adjacent said pit, with their heads directed toward the exit end of said stall bank;

a cow flow passage in each of said banks disposed parallel to said milk stalls and on the opposite side thereof from said pit, said passage having an entry at the entry end of each stall bank and an exit at the exit end of each stall bank;

a prep stall at the entry end of each stall bank disposed to receive cows, contain them and release them into said passage for travel therealong to a selected one of said milk stalls;

milk stall gate means operatively associated with each of said milk stalls for receiving, containing and releasing cows;

milk stall gate actuating means operatively associated with each of said milk stall gate means and interconnected with said milk stall gate means and disposed, upon activation thereof, to operate said milk stall gate means;

prep stall gate means operatively associated with said prep stall for receiving, containing and releasing cows;

prep stall actuating means operatively associated with said prep stall and interconnected with said prep stall gate means, and disposed, upon activation thereof, to operate said prep stall gate means;

power means interconnected with said milk stall gate actuating means and said prep stall gate actuating means and disposed to power the mechanical operation thereof, said power means includes a source of pressurized gas and conduits interconnecting said source with said milk stall gate actuating means and said prep stall gate actuating means; and

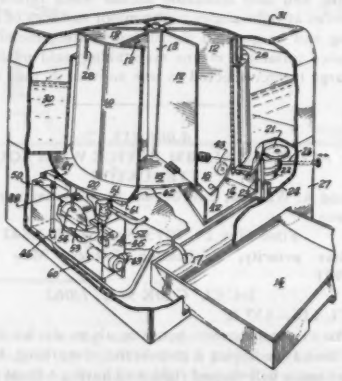
control means interconnected with said power means and disposed to control the activation of said milk stall gate actuating means and said prep stall gate actuating means, said control means includes a source of pressurized gas and a plurality of pneumatically responsive control and logic elements interconnected by pneumatic conduits.

4,000,719

AUTOMATIC PET FEED DISPENSER

Gary H. Richards, 3204 Palm Ave., Manhattan Beach, Calif. 90266

Filed Apr. 30, 1975, Ser. No. 572,963
Int. Cl.² A01K *5/02*
U.S. Cl. 119—51.13 **4 Claims**



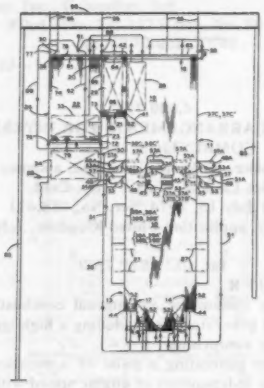
1. Apparatus for automatically dispensing pet feed through a chute into a tray on a predetermined schedule from a feed storage drum supported on an elevated plate, to turn on a vertical axis said drum having internal radial panels vertically disposed for dividing the feed storage volume thereof into sectors, each sector being closed at the bottom by a sector-shaped panel to form a storage bin, each sector-shaped panel being hinged on a leading side to open downwardly under

gravity for dispensing pet feed into said chute, said chute being connected to said horizontal support plate and having its lower end positioned to empty into said tray, said plate having a sector-shaped opening over said chute of sufficient size to permit each sector-shaped panel to drop in turn into said chute as said drum is rotated, said sector-shaped opening in said support plate having sides spaced to permit only one sector-shaped panel to drop at one time, whereby a sector-shaped panel drops as its trailing side passes into said opening, and thereafter is raised back to its horizontal position as its hinged leading side moves past said opening and over said support plate, and means for continually rotating said drum on said support plate about a vertical axis so as to bring said sector-shaped panels into position over said plate opening in succession, said rotating means being comprised of an annular flange concentrically secured to said drum, a wheel, an electric motor connected to drive said wheel and means for biasing said wheel against the rim of said flange to permit setting the position of said drum, and whereby upon running said motor to turn said drum, each sector-shaped panel drops in turn into said chute when in position over said sector-shaped opening in said panel and each dropped panel is gradually raised into a horizontal position as said drum continues to rotate and thereby force the sector-shaped panel against the far side of the sector-shaped opening.

4,000,720
VAPOR GENERATOR

Carl Lieb, Norton, and Edward J. Piaskowski, Massillon, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,564
Int. Cl.² F22B *29/06, 37/24*
U.S. Cl. 122—510 4 Claims

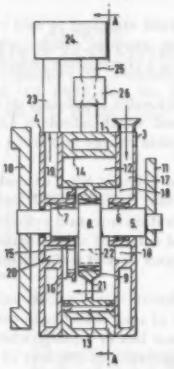


1. In a forced circulation fluid heating unit, upright walls forming a furnace chamber, at least one of the walls including upper and lower panels, each of said panels being comprised of a multiplicity of upwardly extending laterally spaced tubes rigidly united throughout most of their length, mixing header means receiving fluid from the lower panels and discharging the mixed fluid to the upper panels, some of said upper and lower panels being bent out of the plane of the wall at first and second levels, respectively, for connection to the header means and interlaced with and laterally spaced from each other in the plane of the wall between the first and second levels, the first level being subjacent the second level, the remaining upper and lower panels being bent out of the plane of the wall at about the first and second levels, respectively, for connection to the header means, and means for supporting said one wall including metallic webs weld uniting the interlaced upper and lower panels and transmitting the load of the lower panels to the upper panels, and means for top supporting said upper panels.

4,000,721
ROTARY INTERNAL COMBUSTION ENGINES

David Walker Carside, Solihull, England, assignor to Birmingham Small Arms Company Limited, Birmingham, England

Continuation of Ser. No. 529,085, Dec. 3, 1974, abandoned, which is a continuation of Ser. No. 271,813, July 14, 1972, abandoned. This application Feb. 11, 1976, Ser. No. 657,044
Claims priority, application United Kingdom, July 17, 1971, 33676/71; Apr. 29, 1972, 19988/72
Int. Cl.² F02B *55/06*
U.S. Cl. 123—8.01 1 Claim



1. A rotary piston internal combustion engine comprising a housing having a two lobed epitrochoidal bore therethrough, a mainshaft mounted axially within said bore, a rotor of generally equilateral triangular shape mounted on an eccentric journal of the mainshaft for planetary rotation within the bore such that its apices maintain sliding contact with the wall of the bore and thereby form three working chambers which vary in volume as the rotor rotates, said housing having an inlet port leading to said working chambers, means providing axial cooling passages through said rotor, end plates secured to the housing and forming axially spaced end walls closing the bore, a first cooling air induction port in one of the end plates positioned to communicate with said axial cooling passages in the rotor, a second port formed in the outer end plate also positioned to communicate with said axial cooling passages in the rotor, a conduit having a portion external of said engine connecting the second port to said inlet port, air inducted into the working chambers thereby flowing successively through the first port, said rotor cooling passages, the second port and said conduit, a heat exchanger interposed in said external conduit portion so arranged that the induction air flowing through the conduit constitutes substantially the sole heat input to the heat exchanger, said heat exchanger being adapted to dissipate heat from the induction air flowing through said conduit whereby the temperature difference between the induction air flowing through said conduit and ambient air may be reduced, a bypass whereby the induction air flowing through the conduit can bypass the heat exchanger means for selectively opening and closing the bypass passage and means responsive to engine load for operating said bypass passage opening and closing means.

4,000,722

EXTERNALLY IGNITED FOUR CYCLE INTERNAL COMBUSTION ENGINE

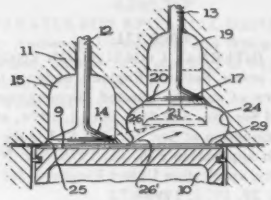
Michael G. May, Bel Air, CH-1180 Rolle, Switzerland

Filed Jan. 29, 1975, Ser. No. 545,023

Claims priority, application Germany, Jan. 30, 1974, 2404395

Int. Cl.² F02B *3/00*

U.S. Cl. 123—30 D **17 Claims**



1. A four-cycle, externally ignited internal combustion engine comprising:

cylinder means;

cylinder head means attached to said cylinder means;

a piston moving reciprocatingly within said cylinder, thereby defining a combustion chamber of varying geometry;

an overhead intake valve for closing an inlet opening having a valve seat and which admits a substantially homogeneous combustible charge and is the only inlet means for said engine;

a chamber in said cylinder head extending said combustion chamber into said cylinder head, said chamber having a depth of penetration into said cylinder head which is less than the lateral extent of said chamber and said chamber having continuous curved walls defining the lateral extent thereof;

an overhead exhaust valve whose valve disc defines the vertical extent of said chamber in said cylinder head and whose valve seat lies in a plane which is displaced from the plane which includes the seat of said inlet valve;

and said piston and said cylinder head are disposed to cooperate so that, at top dead center of said piston, said piston head and said inlet valve disc are substantially parallel and so near each other that, during the end of the compression stroke, the top of said piston and said cylinder head cooperate to define a guide channel originating in the vicinity of said inlet valve disc and leading to said chamber and terminating in said chamber in a substantially tangential manner; whereby gaseous charge is accelerated through said guide channel to thereby enter said chamber substantially tangentially and induce therein a substantially unique vortex flow whose axis of rotation is substantially parallel to the longitudinal cylinder axis;

said piston and said cylinder head further cooperating in such a manner that, at top dead center, the combustible charge is substantially confined to said chamber and to said guide channel only.

4,000,723

ENGINE VALVE MEANS AND PORTING

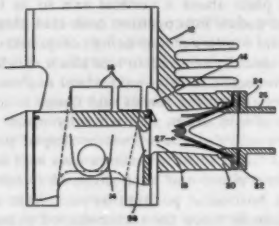
Eyvind Boyesen, Huntingdon Valley, Pa., assignor to Performance Industries, Inc., Huntingdon Valley, Pa.

Division of Ser. No. 375,065, June 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and a continuation-in-part of Ser. No. 361,407, May 8, 1973, abandoned. This application Nov. 15, 1973, Ser. No. 416,213

Int. Cl.² F02B *33/00*

U.S. Cl. 123—73 AA **1 Claim**

1. A variable speed two cycle crankcase compression internal combustion engine comprising a cylinder, a piston movable in the cylinder, a fuel intake system including an intake tract at one side of the cylinder and having reed valve means for controlling the flow through the intake tract, and said intake system including porting in the cylinder wall and in the piston located at the same side of the cylinder as the intake tract, the piston and the cylinder and piston porting being located and proportioned axially of the cylinder to provide flow channel means of substantial cross sectional flow area between the intake tract and the crankcase of the engine throughout the entire cycle of the engine including the bottom dead center position of the piston and thereby provide uninterrupted fuel intake during the stroke of the piston from bottom dead center to top dead center position, and a fuel transfer system for transferring fuel from the crankcase of the engine to the combustion side of the piston including a transfer passage communicating with the crankcase and having a transfer port through the cylinder wall and axially positioned to be closed by the piston in the region of top dead center position of the piston, said transfer port being offset from the cylinder and piston intake porting circumferentially of the cylinder so that a fuel flow path is provided in the transfer system from the crankcase to the cylinder at the combustion side of the piston independently of the intake tract.



4,000,724

IGNITION ARRANGEMENTS FOR INTERNAL COMBUSTION ENGINES

Albert Lewis Fowler, Kirkcaldy, Scotland, assignor to Hughes Microelectronics Limited, Culver City, Calif.

Filed July 15, 1974, Ser. No. 488,411

Claims priority, application United Kingdom, July 14, 1973, 33667/73

Int. Cl.² F02P *1/00*

U.S. Cl. 123—117 R **6 Claims**

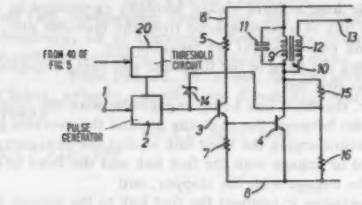
1. An ignition system for an internal combustion engine having a voltage generator for producing a high ignition voltage on discharge comprising:

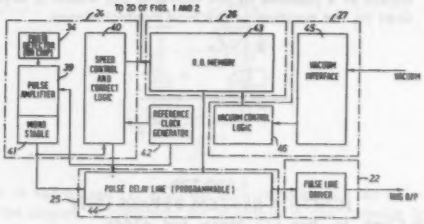
first means for generating a pulse of a duration which is substantially independent of engine speed within at least a predetermined speed range,

second means for utilizing the beginnning and end of said pulse to initiate charging and discharging, respectively, of said generator; and

third means for varying the timing of the beginning of said pulse in response to at least engine speed so that the end of said pulse occurs at an angle in the engine cycle selected according to said speed; said third means including a memory for storing signals representing different angles in the engine cycle as a function of at least engine speed, fourth means for selecting an angle signal from said memory in dependence on at least engine speed, and fifth means for converting the selected angle signal into the appropriate time delay from a reference time to the beginning of said pulse, said fifth means including a clocked time delay device, responsive to said angle signal, for

providing the number of clock pulse intervals of delay which correspond to said angle signal, and sixth means for





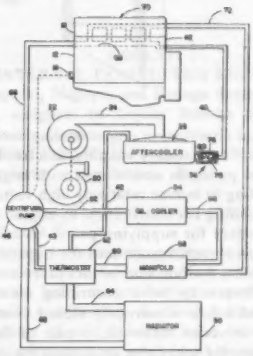
clocking said delay device at a frequency dependent on the engine speed.

4,000,725

AFTERCOOLER COOLANT FLOW CONTROL FOR INTERNAL COMBUSTION ENGINE

Dallas R. Harris, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Mar. 24, 1975, Ser. No. 561,420
Int. Cl.² F02B *33/44*
U.S. Cl. 123—119 CD **7 Claims**



1. In an air breathing liquid cooled internal combustion engine operable between a relatively low idle RPM and at a higher RPM, the combination comprising:

an engine cooling system including means defining a plurality of liquid coolant flow paths,

an engine driven pump pressurizing liquid coolant for flow through said plurality of flow paths at a level increasing generally with increasing engine RPM.

a compressor for pressurizing engine intake air, said compressor having an outlet,

means responsive to operation of said engine for rotating said compressor,

a heat exchanger having a first set of passages receiving air from said compressor outlet for delivery to said engine and a second set of passages in heat exchange relation to said first set of passages, said second set of passages connected to and receiving liquid coolant from said engine cooling system for flow therethrough; and

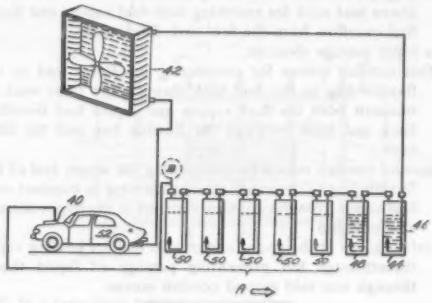
a pressure responsive flow control valve permitting coolant flow through said second set of heat exchanger passages in response to liquid pressure differentials across said heat exchanger exceeding a predetermined level, said pressure differential corresponding to a condition when said engine is operating above said idle RPM.

4,000,726

SAFETY TANK SYSTEM

Sydney Simon, 936 Oranmore St., Pittsburgh, Pa. 15201

Filed Feb. 18, 1975, Ser. No. 550,589
Int. Cl.² F02M *17/22*
U.S. Cl. 123—134 **2 Claims**



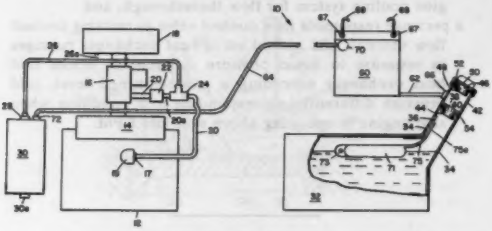
1. An internal combustion engine of the type having fuel mixing means prior to ignition and an exhaust waste discharge means comprising conduit means secured to said exhaust waste discharge means and radiator means, said radiator means being adapted to cool waste discharge gas carried by said conduit means from said exhaust waste discharge means, a second conduit means connected to said radiator means and gas filtration means, said gas filtration means being adapted to clean gas carried by said second conduit means which was cooled by said radiator means, a plurality of fuel tanks in series connected to said filtration means and adapted to receive clean filtered gas from said filtration means, each said fuel tank comprising a body having inlet means and outlet means, a transfer conduit connected to said inlet means and extending into said tank body, an explodable liquid contained within said tank body with the level of said liquid being above one end of said transfer conduit so that gas can bubble upward into said tank to form a gaseous vapor in the top of said tank, richer in fuel composition than it was in the previous tank, said outlet means being positioned above said gasoline level in said tank, a third conduit means secured to the outlet means of the last tank of said series and connecting said outlet means with said fuel mixing means of said internal combustion engine, said internal combustion engine being adapted to ignite and explode said gaseous vapors from said fuel tank to propel moving parts of said engine.

4,000,727

VEHICLE RETROFIT GASOLINE EVAPORATION CONTROL DEVICE

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Sept. 14, 1973, Ser. No. 397,174
Int. Cl.² F02M *21/02*; B65D *25/14*
U.S. Cl. 123—136 13 Claims



1. A device for controlling fuel evaporation and overflow expansion out of an automobile fuel tank filler neck and comprising,

an automobile fuel tank having a filler neck,

an automobile luggage compartment adjacent to and at least partly above said fuel tank,

container means including a flexible and expandable and substantially completely collapsible bag located in said luggage compartment and positioned with its lower end above said neck for receiving both fuel vapors and liquid fuel overflow from the fuel tank filler neck,

a vapor storage element,

first conduit means for connecting the lower end of the flexible bag to the fuel tank through the filler neck to transmit both the fuel vapors and liquid fuel overflow back and forth between the flexible bag and the filler neck,

second conduit means for connecting the upper end of the flexible bag to the vapor storage element to conduct only fuel vapor from the container means to the vapor storage element, and

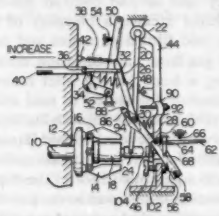
valve means at the upper end of said bag for passing vapor therethrough but preventing passage of liquid therethrough into said second conduit means.

4,000,728

FUEL INJECTION GOVERNOR

Fuminori Kurokawa, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,741
Claims priority, application Japan, Aug. 15, 1974, 49-93547
Int. Cl.² F02D *1/04*
U.S. Cl. 123—140 R 13 Claims



1. A fuel injection pump governor, comprising:

a fuel control member;

a movable pin;

flyweights connected to move the movable pin in dependence on a flyweight rotational speed;

a first link pivotal about the movable pin, the first link being pivotally connected to the fuel control member at a point spaced from the movable pin;

a second link pivotal about the movable pin;

a movable load control means pivotally connected to the second link at a point spaced from the movable pin;

a third link pivotal about the movable pin;

an engaging pin fixed to the third link and being engageable with the first link;

a stopper, the third link being engageable with the stopper at a point between the engaging pin and the movable pin;

biasing means urging the third link so that the engaging pin is urged to engage with the first link and the third link is urged to engage with the stopper; and

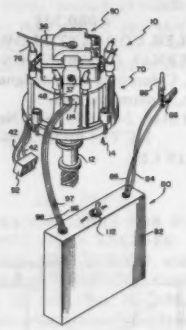
means operative to connect the first link to the second link for unitary pivotal movement about the point of pivotal connection between the second link and the load control means at a position of the movable pin which is dependent on the position of the load control means.

4,000,729

IGNITION SYSTEM BYPASS UNIT

Jack Clark, Jr., Box 122, Milan, Ind. 47445

Filed Apr. 23, 1975, Ser. No. 570,841
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 DS 6 Claims

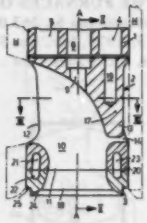


1. In an internal combustion engine having an ignition coil with a primary and a secondary winding, electronic means for supplying ignition pulses in accordance with engine speed to the primary winding to induce relatively high voltage pulses in the secondary winding for distribution to engine spark plugs, and a storage battery for supplying power to said electronic means, an ignition system bypass unit for bypassing the electronic means when a malfunction occurs therein comprising a relatively high frequency pulse generating means having a magnetic coil and a pair of normally closed contacts electrically connected in series therewith, a pair of first leads for electrically connecting said pulse generating means across the storage battery to energize said generating means, and a pair of second leads for electrically connecting said magnetic coil in parallel with the ignition coil primary winding and said contacts in series with the ignition coil primary winding, said magnetic coil being operative to alternately magnetically open said contacts to cause collapse of a magnetic field and to allow said contacts to return to a normally closed position whereby a relatively high frequency string of ignition pulses is applied to the primary winding to induce a corresponding frequency string of relatively high voltage pulses in the secondary winding for distribution of the engine spark plugs to allow at least temporary operation of the engine.

4,000,730
VALVE CAGE STRUCTURE FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY ADAPTED FOR FLUID COOLING

Adolf Ötti, Stadtbergen; Fredy Dost, and Otto Breindl, both of Augsburg, all of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany

Filed Feb. 21, 1975, Ser. No. 551,619
Claims priority, application Germany, Mar. 7, 1974, 2410893
Int. Cl.² F01L 3/00
U.S. Cl. 123—189 19 Claims



1. A valve cage (1, 2, 3) for combination with the cylinder of the engine, particularly for insertion in the cylinder head structure (H) thereof, said cage being formed with a valve seat (24) located centrally therein, and a charge exchange passage (10) extending along the longitudinal axis (A—A) of the cage and leading from the valve seat (24) to a lateral opening (12) to effect communication of gases between a manifold and an internal combustion engine cylinder, said cage having a back wall (13) located opposite the lateral opening (12) to delimit said passage (10),

characterized by an arrangement to equalize the stresses placed on the cage during operation of the engine due to non-symmetrical location of the lateral opening (12) of the charge exchange passage with respect to the longitudinal axis (A—A) of the cage comprising

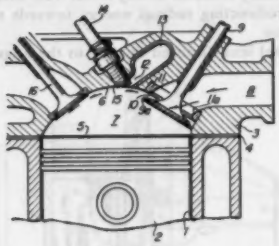
a transverse slit (14,30) formed in said back wall (13) located with respect to said longitudinal axis (A—A) opposite said lateral opening (12) and extending at least in part transversely to the longitudinal axis (A—A) of the valve cage.

4,000,731
INTERNAL COMBUSTON ENGINES

Masaaki Noguchi, Nagoya, and Shougo Sanda, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 28, 1975, Ser. No. 554,236
Claims priority, application Japan, Sept. 17, 1974, 49-107337
Int. Cl.² F02B 17/00, 19/18
U.S. Cl. 123—191 S 9 Claims

1. An internal combustion engine comprising: cylinder means, piston means slidably disposed within said cylinder means, cylinder head means having a semispherical inner surface, a main combustion chamber defined by said semispherical surface of said cylinder head means and the top surface of said piston means, intake port means through which a homogeneous and relatively lean mixture flows into said main combustion chamber, an auxiliary combustion chamber confined in said cylinder head means, passage means communicating both said main and auxiliary chambers, an intake valve having a valve face for adjusting the opening degree of said intake port means, an axis of said intake valve means and a center line of said intake port means close to said intake valve being directed substantially toward the central portion of said cylinder means when extended, said valve face being inclined, at a portion near an apex of said semispherical surface, nearly tangential to said semispherical surface so as to permit a main stream of the mixture to flow along said semispherical surface, said passage means being opened to said

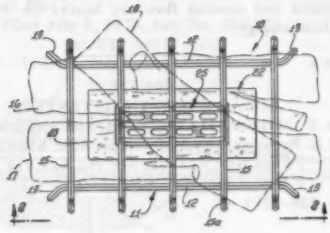


main combustion chamber at a portion deviated from a central axis of said cylinder means by a distance less than a radius of said valve face, and an ignition plug having electrodes disposed near said opening portion of said passage means.

4,000,732
SOLID WICK LIGHTER

William S. White, Pasadena, Calif., assignor to Robert H. Peterson Company, Chicago, Ill.

Filed May 27, 1975, Ser. No. 580,543
Int. Cl.² F24B 1/18
U.S. Cl. 126—92 R 5 Claims



1. In a two-piece lighter,

a. a solid, one-piece, refractory, fire-resistant receptacle, and

b. a fire-resistant, one-piece solid porous wick freely downwardly received in the receptacle and seated thereon below the wick to adsorb liquid fuel poured into the receptacle and over the wick, the wick defining at least one longitudinally extending carburetion channel which has open ends and also opens upwardly, and a plurality of vertical through openings located directly below said channel and being spaced lengthwise thereof to receive said liquid fuel and to support combustion in said channel, the width of the channel exceeding the widths of said openings,

c. whereby controlled combustion of said fuel takes place on and over said wick.

4,000,733
SOLAR FURNACE

Lou Allen Pauly, c/o Nels Welch 25568 Wolf Creek Road, Veneta, Oreg. 97487

Filed Oct. 31, 1975, Ser. No. 627,600
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 4 Claims

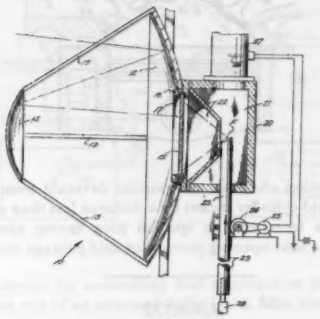
1. In a system for concentrating radiant energy including multiple positionable mirrors remotely located from and re-

flecting radiant energy toward a solar furnace, the improvement embodied in a solar furnace, comprising

a primary reflector receiving radiant energy from said positionable mirrors,

a secondary reflector axially offset from said primary reflector redirecting radiant energy towards said primary reflector,

a Fresnel lens disposed normal to the aligned axes of said



primary and secondary reflectors and receiving radiant energy from said secondary reflector, and

a chamber defined by furnace structure within which the focal point of the Fresnel lens is located, said chamber adapted to receive conduit means carrying an oxygen and hydrogen flow and having a discharge end in close proximity to the focal point of the Fresnel lens whereby the conduit and conduit flow are heated by concentrated radiant energy.

4,000,734

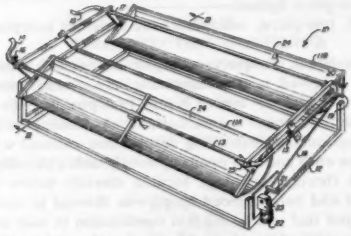
SOLAR ENERGY CONVERTER

William C. Matlock, 2123 S. Priest, and Patricia K. Somlo, 2045 E. Broadway, both of Tempe, Ariz. 85282

Filed Nov. 6, 1975, Ser. No. 629,518

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 4 Claims



1. An improved heat exchange means comprising:

a frame,

at least a pair of juxtapositioned reflectors,

each of said reflectors comprises a trough having a reflecting surface of a parabolic configuration,

means for pivotally mounting each of said reflectors in a parallel arrangement on said frame,

a fluid bearing tube a portion of which is fixedly mounted on said frame longitudinally of each of said reflectors on said frame and approximately disposed with the axis of the portion in the focal zone of an associated reflector outside of its periphery,

electrical means for moving said reflectors in unison through a similar arc partially around the portion of the tube associated with said reflectors for maintaining said reflectors with the axis of their curvature approximately in a plane containing the sun's center, and

means for sensing the position of the sun for energizing said electric means for orienting and maintaining said reflectors with their axes of curvature of their inner surfaces approximately in a plane containing the sun's center,

whereby the reflection of the sun's rays are concentrated by said reflectors in a line image along said portions of said tubes.

4,000,735

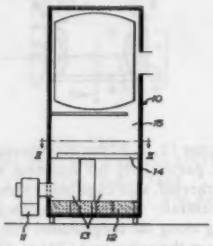
INSERT FOR THE FURNACES OF BOILERS

Sten Rune Ljung, Barnstensgatan 6,, 263 00 Hoganas, Sweden

Filed May 5, 1975, Ser. No. 574,281

Int. Cl.² F24H *1/34*

U.S. Cl. 126—361 2 Claims



1. In a boiler, particularly an oil-fired boiler, for intermittent operation, an intermittently fired oil burner, an insert placed in the furnace of said boiler, said insert comprising an assembly of elements of heat radiating fire-resisting glass of slight thickness in relation to their total surface area, said assembly being so located in association with the burner of said boiler that heat accumulation occurs at the same time as full use is made of the property of the glass to transmit the flame radiation.

4,000,736

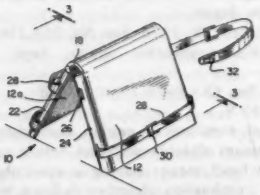
POSTURE DEVICE

Frank Bruscemi, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 26, 1975, Ser. No. 616,915

Int. Cl.² A61F *3/00*

U.S. Cl. 128—80 R 7 Claims



1. A posture improvement device adapted to contact the leg adjacent the thighs and calves of an individual's body, comprising a substantially rigid U shaped member having at least two converging substantially planar surfaces adapted to contact said leg, said member defining an angle of less than about 90° therebetween, at least one strap member integral with each of said planar surfaces of U shaped member and communicating by both distal ends therewith, said strap adapted to contact said leg and firmly engage the same to contact with said surface, at least one surface of said member including cushioning means, said U shaped member com-

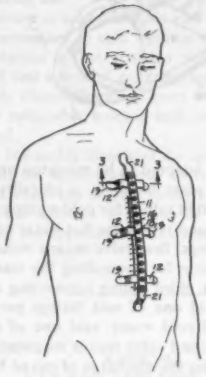
prised of a single sheet forming a pair of substantially planar members having an arcuate shape therebetween thereby forming said U shape.

4,000,737

SURGICAL INCISION SHIELD

Clifford V. Horn, 457 Lakeview Way, Redwood City, Calif. 94062

Filed Oct. 14, 1975, Ser. No. 621,959
Int. Cl.² A61F *13/00*
U.S. Cl. 128—154 10 Claims



1. A shield for recent surgical incision sites comprising in combination,

a longitudinal strip composed of a relatively rigid material,

a plurality of U-shaped support elements each composed of a relatively rigid material oriented perpendicularly with respect to said longitudinal strip adapted to support said strip above and parallel said incision site, said U-shaped support elements bridging the incision site,

an end support leg extending from at least one end of said longitudinal strip adapted to support the end of said strip,

means for securing the distal ends of said U-shaped support elements to the skin surface on each side of the incision site and for securing the distal end of said support leg to the skin surface beyond the end of said incision.

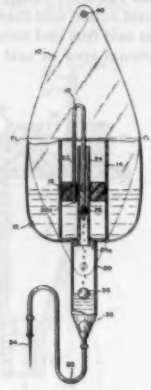
4,000,738

PARENTERAL FLUID ADMINISTRATION SET (PLASTIC-BAG TYPE)

William L. Howell, 3615 Macomb St. NW., Washington, D.C. 20016

Filed Dec. 19, 1975, Ser. No. 642,365
Int. Cl.² A61M *5/14*
U.S. Cl. 128—214 D 7 Claims

1. A parenteral fluid administration set comprising a plastic bag adapted to be filled with a parenteral fluid to be administered intravenously up to the approximate level of a fold-over line extending transversly across the bag, said bag having an outlet opening and a tubing line extending therefrom to an infusion needle, a floating siphon in said bag adapted to be immersed in said fluid when the bag is so filled, said siphon having fluid inlet and fluid outlet legs, said outlet leg having an end extending through said outlet opening and providing a fluid outlet from said bag, means including a receiving reservoir affixed to said bag outlet and depending from said bag and being connected to said tubing line which in turn is connected to said infusion needle, means for conditioning the floating siphon for operation, and means for rendering said floating siphon operative to dispense said fluid through said



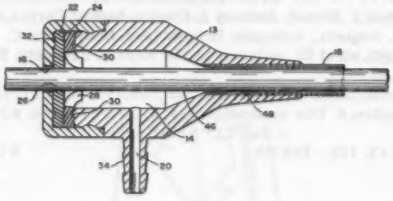
extending end of said siphon outlet leg to said receiving reservoir at a controllable constant rate.

4,000,739

HEMOSTASIS CANNULA

Robert C. Stevens, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed July 9, 1975, Ser. No. 594,521
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214.4 4 Claims



1. A hemostasis cannula comprising a body having a passage therethrough adapted to receive a catheter, a first disc-like gasket having a round hole disposed therein mounted in said passage, and a second disc-like gasket having a Y-slit located therein, said second gasket being mounted in said passage in face-to-face contact with said first gasket, said first gasket being operable to maintain a seal around and to allow manipulation of a catheter contained in said passage, the face-to-face relationship of said gaskets serving to support said second gasket in its closed position when a catheter is absent from said passage.

4,000,740

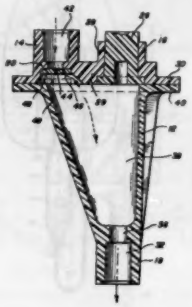
INJECTION SITE

Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 475,215, May 31, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,170
Int. Cl.² A61M *5/14*
U.S. Cl. 128—214 R 18 Claims

1. An injection site for location between a parenteral source of fluid and a patient, which comprises: a first inlet to which a conduit from a first liquid container is adapted to be connected; a second inlet adapted to receive needle-injected

medication; an outlet through which the combined first liquid and injected medication can flow with said outlet adapted for coupling to a conduit; a main body portion defining a single chamber that communicates with said first and second inlets and said outlet, said chamber having a sloped wall between said first inlet and said outlet, said chamber having a cross-sectional area adjacent said first and second inlets that is greater than the cross-sectional area of said chamber adjacent said



outlet, said chamber having a cross-sectional area that is substantially greater than the cross-sectional area of said first inlet; said second inlet and said outlet being substantially coaxial, whereby the needle is substantially prevented from piercing the chamber, and said chamber being constructed to provide unobstructed flow of the first liquid and medication to said outlet; and a check valve located in said first inlet and adjacent said chamber.

4,000,741

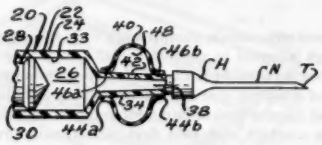
SYRINGE ASSEMBLY

William J. Binard; Anthony J. Ciarico, both of Cary; Leonard R. Anglada, Arlington Heights, and Bhupendra C. Patel, Elgin, all of Ill., assignors to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 509,757, Sept. 27, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 627,982

Int. Cl.² A61M *5/00*

U.S. Cl. 128—218 NV **8 Claims**



1. A syringe, comprising:

a barrel having a chamber for retaining fluid;

an extension member defining a tip of the syringe for attachment to a fluid receiving device, said extension member extending between said barrel and tip and defining passageway means communicating between the syringe chamber and tip, said extension member having opening means communicating between the passageway means and the outside of the extension member;

a plunger having one end received in said chamber for pumping fluid from the chamber into the passageway means; and

a flexible balloon secured to the extension member over said opening means and defining a cavity communicating with the passageway means through the opening means, said balloon inflating above a predetermined pressure to relieve pressure generated by the syringe.

4,000,742

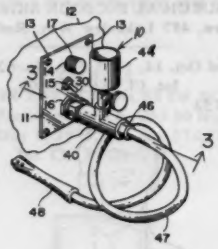
WALL MOUNTED HYGIENIC DEVICE

Edward F. DiGiacomo, 6930 NW. 186th St., Apt. 302, Hialeah, Fla. 33015

Filed Oct. 20, 1975, Ser. No. 623,768

Int. Cl.² A61M *3/00*

U.S. Cl. 128—229 **1 Claim**



1. A hygienic device adapted to be mounted on a wall and the like comprising a plate member, a plurality of fittings mounted on said plate, first tubing for cold water connected to one of said fittings, second tubing for hot water connected to the second of said fittings, first valve means mounted in the said second of said fittings for controlling the rate of flow of hot water therethrough, third tubing connecting said second of said fittings with said one of said fittings permitting the mixing of said hot and cold water, said one of said fittings having a first outlet, second valve means mounted in said one of said fittings controlling the discharge of mixed hot and cold water through said first outlet, fourth tubing connecting said first outlet and the third of said fittings, said third of said fittings having a second outlet, a slide valve mounted in said third of said fittings, spring means yieldingly maintaining said slide valve in a closed position and quick coupler means received by said third of said fittings at said second outlet engaging and sliding said slide valve to an open position for discharging said mixture of hot and cold water through said quick coupler means, said quick coupler means having an inlet, a discharge outlet, and a venturi connecting said inlet and said discharge outlet, an open receptacle mounted on said quick coupler means, a passageway connecting said receptacle and said venturi and needle valve means controlling the flow of fluid from said receptacle into said venturi, flexible hose means connected to said discharge outlet at one end and a nozzle connected to the free end of said flexible hose.

4,000,743

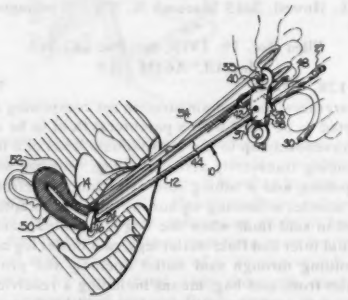
UTERINE ANTEVERTER

Kenneth Weaver, 1511 N. Main, Waynesville, N.C. 28786

Filed July 9, 1975, Ser. No. 594,203

Int. Cl.² A61B *17/42*; A61M *25/02*

U.S. Cl. 128—303 R **9 Claims**



1. An apparatus for moving a retroverted uterus to an anterior position to facilitate visualization of the uterus during a

laparoscopic procedure or the like, and characterized by the ability to be self-retained in its operative position so as to avoid the need for further attention from the physician during the course of the procedure, said apparatus comprising

an elongate rod having a forward end and a rearward end,

a manipulating arm having one end pivotally mounted immediately adjacent said forward end of said rod, said arm having a length sufficient to extend a substantial distance into the uterine cavity and including a shield coaxially disposed about said one end of said arm so as to lie closely adjacent the pivotal connection between said arm and rod to limit the distance which said arm may be inserted into the uterine cavity and to effectively preclude contact between the pivotal connection and the body of the patient during use,

means carried at said rearward end of said rod and operatively connected to said arm for selectively pivoting said arm between a first position substantially coaxial with said rod and a second generally upright position which is angularly disposed with respect to said rod,

means for releasably holding said arm in said upright position, and

means for releasably attaching the apparatus to a tenaculum such that the apparatus may be retained in an operative position within the uterine cavity by attaching the tenaculum to the anterior or posterior lip of the uterus and attaching the apparatus to the tenaculum.

4,000,744

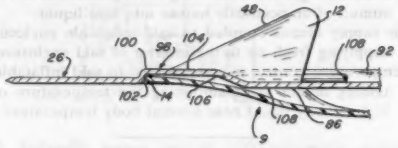
EAR TAG APPLYING TOOL

Eugene B. Ritchey, Rte. 3, Box 58, Brighton, Colo. 80601

Continuation-in-part of Ser. No. 513,655, Oct. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,604, Aug. 5, 1974, abandoned. This application Feb. 10, 1975, Ser. No. 548,249

Int. Cl.² A61B 17/00

U.S. Cl. 128—330 13 Claims



1. A tool for piercing a portion of the skin of an animal accessible from opposite sides to form a generally planar slit for inserting a loopless animal identification tag having a pair of flexible laterally extending foldable securing ledges, a tag portion, and a relatively narrower skin traversing portion joining said laterally extending securing ledges and said tag portion, said tool being characterized in that it is removable from the portion of the animal's skin from either side, said tool comprising an elongated rigid member having:

a handle portion;

an integral portion, pointed, flattened, generally planar and sharpened skin piercing end portion to pierce the portion of the animal's skin and form a slit for passage of said securing ledges therethrough; and

an intermediate integral tag holding portion joining said handle portion and said sharpened end portion including longitudinally extending slot means near said pointed end portion lying in a plane parallel to that of said flattened end portion for releasably holding the pair of laterally extending securing ledges of said identification tag in a folded attitude generally perpendicular to the plane of said flattened end portion prior to insertion through the slit.

4,000,745

ELECTRICAL LEADS FOR CARDIAC STIMULATORS AND RELATED METHODS AND MEANS

Edward M. Goldberg, 26 Crescent Drive, Glencoe, Ill. 60022

Filed Aug. 5, 1968, Ser. No. 750,218

Int. Cl.² A61N 1/04

U.S. Cl. 128—418 25 Claims

1. An electrical lead that may be screwed into an organ which comprises an insulated electrical conducting section and a lead-in securing section with a longitudinally rigid helical member which may be screwed into the organ.

4,000,746

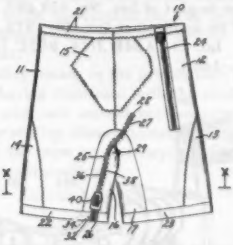
PANTY GIRDLE CONSTRUCTION

Jeannette I. Fierst, 2 Weybridge Road, Great Neck, N.Y. 11023

Continuation-in-part of Ser. No. 275,738, July 27, 1972, abandoned. This application June 4, 1975, Ser. No. 584,021

Int. Cl.² A41C 1/00

U.S. Cl. 128—526 10 Claims



1. In a panty girdle of a type including a pair of leg portions normally enclosing at least partially the thighs of a wearer, and including a pair of front panels and a permanently attached crotch member interconnecting said front panels, the improvement comprising: detachably attachable fastener closure means having first and second edges and extending upwardly from a lower edge of one of said legs of said girdle across a forwardly disposed portion of said crotch member and terminating at a point substantially above said crotch member on a front panel forming a part of the other of said legs; whereby, when said fastener closure means is separated the said edges may be separated and the parts of said girdle forming said first mentioned leg may be folded upwardly along a substantially horizontal line disposed substantially above the crotch of the wearer to be maintained in such condition by tension imparted by the shape of the body of the wearer and the remaining parts of the girdle.

4,000,747

FEED MECHANISM FOR PEANUT COMBINE

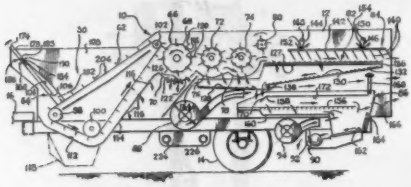
Alexander J. Rodger, Potgietersrus, South Africa, assignor to Slattery Manufacturing (Proprietary) Ltd., Potgietersrus, South Africa

Filed Mar. 12, 1975, Ser. No. 557,729

Claims priority, application South Africa, Mar. 18, 1974, 74/1747

Int. Cl.² A01D *29/00*

U.S. Cl. 130—30 C 3 Claims



1. A peanut combine including a frame; peanut picking, separating and cleaning means mounted on the frame; a hopper for receiving peanuts and peanut vines mounted on the frame adjacent to the peanut picking means; and a chain and slat conveyor for conveying peanuts and peanut vines from the hopper to the peanut picking means characterized by said hopper including a lower exit opening positioned below and forward of the peanut picking means and said chain and slat conveyor including an upper run which forms a portion of the hopper and conveys peanuts and peanut vines down and through the lower exit opening and a lower run and an associated crop support plate for conveying peanuts and peanut vines from the lower exit opening to the peanut picking means.

4,000,748

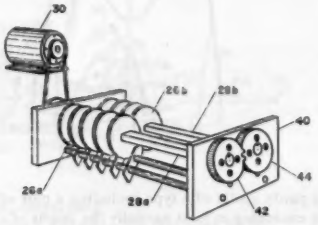
APPARATUS AND PROCESS FOR SHREDDING AND CRIMPING SMOKING MATERIALS

Thomas Wade Summers, Fern Creek, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 459,497, April 10, 1974, abandoned. This application Jan. 30, 1975, Ser. No. 545,442

Int. Cl.² A24B *3/18*; B02C *7/04*

U.S. Cl. 131—140 C 7 Claims



1. A process for simultaneously shredding and crimping a sheet of tobacco material comprising the steps of:

a. maintaining the moisture level of the sheet between about 15 to 30% by weight and

b. moving the sheet between a pair of rotating and intermeshing stacks of disks having a predetermined overlap ratio and spacing between opposing disks such that the sheet is shredded into a plurality of strips about 0.65 to 1.55 mm in width and the forward motion of each strip is retarded by engagement with the facing surfaces of neighboring disks causing buckling to occur across each strip, thereby resulting in each strip attaining a crimped configuration.

4,000,749

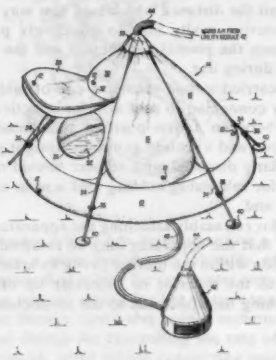
ISOLATION MODULE

Francis J. Busco, Big Sur, Calif., assignor to Float, Big Sur, Calif.

Filed May 30, 1975, Ser. No. 582,448

Int. Cl.² A45F *1/02*

U.S. Cl. 135—1 R 16 Claims



1. A portable isolation module for reducing ordinary levels of stimulation comprising:

an inflatable enclosure of sufficient size to accommodate at least one adult;

inflatable containing means at the base of said inflatable enclosure containing a pool of a high density liquid of sufficient size for supporting at least one adult in a state of floatation;

said inflatable containing means including an inflatable bottom portion supporting said liquid on a cushion of contained gas for minimizing the transmission of external stimuli of an accoustic nature into said liquid;

air supply means coupled to said inflatable enclosure for supplying fresh air to the interior of said enclosure; and

temperature control means coupled to said inflatable containing means for maintaining the temperature of said high density liquid near normal body temperature.

4,000,750

LARGE SHELTER UMBRELLA

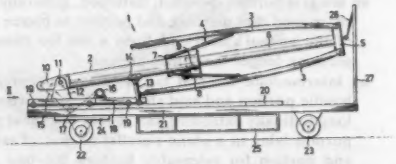
Klaus Becher, Gummersbach, Germany, assignor to Carl Becher OHG Planen- und Zelte-Fabrik, Gummersbach, Germany

Filed Aug. 28, 1975, Ser. No. 608,512

Claims priority, application Germany, Aug. 31, 1974, 2441816

Int. Cl.² A45B *3/00*, *17/00*

U.S. Cl. 135—16 8 Claims



5. A large shelter umbrella comprising a base, an umbrella including a supporting post having first and second opposite terminal end portions, first pivot means mounting said sup-

porting post adjacent a terminal end of said first terminal end portion for pivotal movement about a generally horizontal axis for pivotal movement of said supporting post between generally horizontal and vertical positions, cable means connected to said first terminal end portions, means for forcefully drawing said cable means to pivot said support post about said horizontal axis from said horizontal position to said vertical position, said base being a platform mounted for sliding movement upon a carriage, said first pivot means is carried by said platform, said drawing means is carried by said platform, and means carried by said carriage about which said cable means is at least partially entrained.

4,000,751

HYDRAULIC POWER SYSTEM WITH AUTOMATIC PRIORITY-DEMAND FLOW CONTROL MEANS

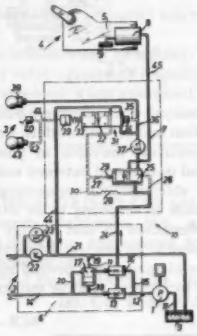
Franz Henninghaus, Dormagen, Germany, assignor to International Harvester Company, Chicago, Ill.

Filed Dec. 12, 1975, Ser. No. 640,140

Claims priority, application Germany, Dec. 12, 1974, 2458897

Int. Cl.² G05D *11/02*

U.S. Cl. 137—101 **7 Claims**



1. A hydraulic power system with automatic priority-demand flow control means, comprising:

first, second, and third hydraulic power circuits wherein at least the first circuit has priority over the other two circuits;

a single fluid source means for supplying hydraulic fluid to the three circuits; and

a flow control valve means in the first circuit for receiving the flow of hydraulic fluid from the source means and apportioning it between the three circuits, the control valve means including a priority-demand flow control valve means for diverting a portion of the apportioned flow to the second and the third circuits and combining the portion with the apportioned flow to the first circuit upon demand of additional hydraulic fluid by the first circuit;

a second flow control valve means in the second circuit for receiving the apportioned flow for the second and third circuits and re-apportioning it between the aforementioned two circuits, and including a second priority-demand flow control valve means for diverting a portion of the re-apportioned flow to the third circuit and combining the portion with the re-apportioned flow to the second circuit upon demand of additional hydraulic fluid by the second circuit.

4,000,752

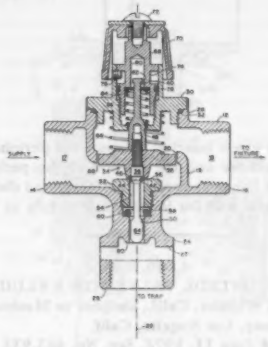
DOUBLE-JET ACTING TRAP PRIMER

Louis M. Miller, Haverhill, and Rand H. Ackroyd, Methuen, both of Mass., assignors to Watts Regulator Company, Lawrence, Mass.

Filed June 9, 1975, Ser. No. 584,737

Int. Cl.² F16K *31/143*

U.S. Cl. 137—118 **12 Claims**



1. A trap primer having, in combination,

a body forming a main flow passage with a partition separating inlet and outlet chambers therein respectively adapted for connection to a supply line and fixture, the partition having an aperture, the body having a primer flow passage for connection to a trap and communicating with the inlet chamber through a valve seat,

a stem having a trap disc and a reaction disc and movable to a position in which the trap disc closes the valve seat with the reaction disc located with annular clearance substantially in the aperture, the stem being extended through the valve seat in the direction of the trap by a first portion of reduced diameter and a second portion of relatively larger diameter,

and annular sealing means in the primer flow passage, said first portion having clearance with the sealing means in said position and said second portion entering through and in annular sealing relation to said sealing means upon movement of the stem to and beyond a predetermined distance from said position.

4,000,753

MEANS FOR LOCKING REPLACEABLE NOZZLES TO FIRE HYDRANTS

Daniel A. Ellis, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed July 29, 1975, Ser. No. 600,191

Int. Cl.² E03B *9/04*

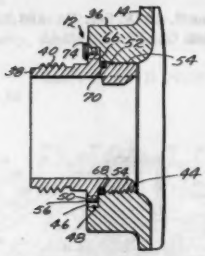
U.S. Cl. 137—296 **10 Claims**

1. In a fire hydrant:

a barrel having an outwardly extending boss, said boss having a bore therethrough terminating at its outer end portion in a counterbore having a peripheral wall and an outwardly facing radial wall, said bore having interior threads on its inner end portion terminating short of said counterbore;

a replaceable nozzle having an outwardly and radially extending flange intermediate its outer and inner end portions and arranged to be received in said counterbore, said flange having at least a portion of its peripheral surface spaced radially inwardly a predetermined dis-

tance from the peripheral wall of said counterbore, said nozzle having exterior threads on its inner end portion for receiving the interior threads of said boss; and,



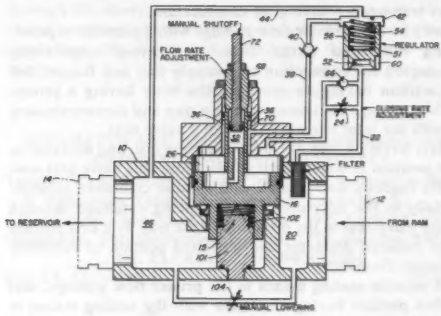
a self-tapping screw inserted between the peripheral wall of said counterbore and the portion of the peripheral surface of said flange spaced a predetermined distance from the peripheral wall for locking said nozzle to said boss.

4,000,754

AUTOMATIC CONTROL VALVE FOR A FLUID SYSTEM

Daniel W. Risk, Whittier, Calif., assignor to Maxton Manufacturing Company, Los Angeles, Calif.

Filed June 11, 1974, Ser. No. 463,933
Int. Cl.² G05D 7/01
U.S. Cl. 137—487 **26 Claims**



22. An automatic control valve for a fluid system comprising:

a valve body,

first and second chambers in said valve body in fluid communication with the fluid system,

a port in said valve body interconnecting said first and second chambers for the passage of a fluid therethrough,

adjustable valve means for controlling the flow of fluid through said port,

fluid responsive valve actuator means for positioning said valve means in relationship to said port to control the passage of the fluid therethrough,

first bypass conduit means for interconnecting said first chamber and said valve actuator means in fluid communication,

second bypass conduit means for interconnecting said second chamber and said valve actuator means in fluid communication,

control valve means connected across said first and second bypass conduit means for porting fluid flow through said second bypass conduit,

means responsive to pressure differential between said first and second chambers for closing said control valve means when said pressure differential exceeds a predetermined value,

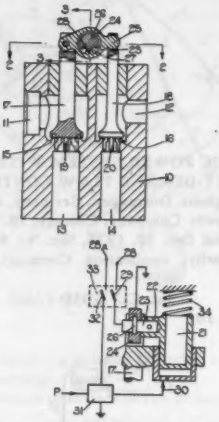
thereby to build up pressure on said valve actuator means and close said port.

4,000,755

FLUID FLOW CONTROL VALVES

George Orloff, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 26, 1976, Ser. No. 661,418
Claims priority, application United Kingdom, Mar. 7, 1975, 9512/75
Int. Cl.² F16K 11/14
U.S. Cl. 137—595 **12 Claims**



1. A fluid flow control valve comprising a body having first and second inlets and first and second outlets, first and second control elements respectively movable to control flow between said first inlet and outlet, and between said second inlet and outlet, a linkage element interconnecting said control elements, a part movable in response to an external control signal and pivotally connected to said linkage element, and locking means, responsive to an electrical operating signal, for restraining said linkage element from pivotal movement relative to said part, so as to prevent relative movement between said control elements.

4,000,756

HIGH SPEED ENGINE VALVE ACTUATOR

Louis A. Ule, 27 Mustang Road, Rolling Hills, Calif. 90274, and Gunnar P. Michelson, 7416½ Sepulveda Blvd., Van Nuys, Calif. 91405

Division of Ser. No. 454,683, March 25, 1974, Pat. No. 3,926,159. This application Oct. 6, 1975, Ser. No. 619,648
Int. Cl.² F16K 31/12
U.S. Cl. 137—596.17 **4 Claims**

1. An electro-hydraulic actuator comprising:

a housing having an open-ended cylindrical cavity formed therein, wherein said cavity has a bottom;

a piston having a bottom end and being slidably disposed within said cylindrical cavity with said bottom end disposed adjacent to the bottom of said cavity;

said housing having an inlet passage which communicates with said cavity through said bottom thereof forming an annular valve seat;

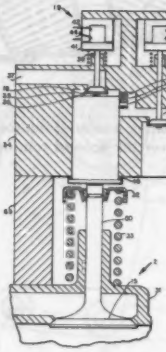
an inlet valve having a head and a stem with said head disposed within said cavity and said stem passing through said inlet passage so that said head is disposed to seal against said valve seat;

said housing having an outlet passage communicating with said cavity, substantially near the bottom thereof;

said housing having a duct communicating with said outlet

passage and said duct having an annular valve seat formed at its end facing away from said cavity;

an outlet valve having a head and a stem, with said head thereof disposed to make contact with said valve seat of said duct and said stem thereof passing through said seat and through the wall of said duct to extend outside of said housing in journaled relationship therewith;



an inlet solenoid and an outlet solenoid mounted onto said housing;

said inlet solenoid, when energized, being disposed to urge said inlet valve against its respective valve seat; and

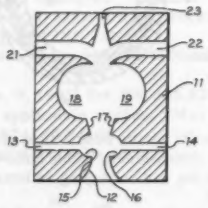
said outlet solenoid, when energized, being disposed to urge the outlet valve against its respective valve seat.

4,000,757

HIGH GAIN FLUID AMPLIFIER

Peter A. Freeman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1975, Ser. No. 637,809
Int. Cl.² F15C 1/10
U.S. Cl. 137—834 **2 Claims**



1. A high gain fluid amplifier comprising,

an inlet for supplying power fluid,

a centrally located output vent,

a pair of differential flow outlets disposed one each on each side of said output vent,

a pair of opposed lobe-shaped feedback cavities positioned between said inlet and said outlets for alternately switching fluid to said differential flow outlets,

a pair of opposed lobe-shaped control cavities,

a pair of control inlets connected one each into said opposed lobe-shaped control cavities for supplying control fluid for controlling movement of power fluid into said output vent and said differential flow outlets, and

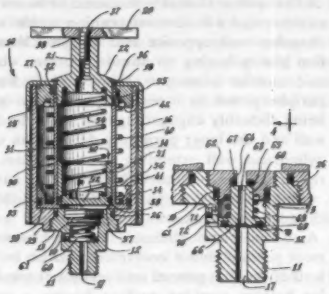
short angularly disposed sidewalls positioned between said control cavities and said feedback cavities.

4,000,758

FLUID RESERVOIR DEVICE WITH FILL MEANS, LEVEL INDICATOR MEANS AND PRESSURE RELIEF MEANS

Daniel T. Meisenheimer, Jr., 404 Longmeadow Road, Orange, Conn. 06477

Filed Oct. 21, 1974, Ser. No. 516,727
Int. Cl.² F16L 55/04
U.S. Cl. 138—31 **12 Claims**



1. A fluid reservoir device for connection to and use in conjunction with a fluid-filled system, the fluid reservoir device comprising:

A. means defining a chamber having a volume, said means also defining an inlet opening into said chamber, a fluid bleed passage connecting with the inlet opening into said chamber, and a first piston-receiving opening in said chamber, said means being adapted for attachment to a fluid-filled system with the inlet opening in communication with fluid in said fluid-filled system;

B. a first piston slideably mounted in and closing said first piston-receiving opening in said chamber, said first piston slideable between (1) a first position displacing a maximum first piston volume and thereby decreasing the volume of the chamber by said maximum first piston volume, and (2) a second position displacing a minimum first piston volume thereby decreasing the volume of said chamber by a minimum first piston volume;

C. spring biasing means for sliding said first piston from said first position to said second position to decrease the volume of said chamber; and

D. pressure responsive means normally blocking said fluid bleed passage and unblocking said fluid bleed passage in response to excessive fluid pressure, thereby relieving excessive pressure in said fluid-filled system and said fluid reservoir device by bleeding fluid from said chamber through said fluid bleed passage, said pressure responsive means comprising

1. a piston slideably mounted in the inlet opening to said chamber, the piston defining an opening therethrough to permit passage of fluid from the fluid-filled system to the chamber, and

2. spring biasing means normally maintaining said piston in a position blocking said fluid bleed passage, said piston having a working surface exposed to the fluid such that excessive pressure of the fluid lifts the piston against its spring biasing means to permit fluid to escape through the fluid bleed passage,

whereby when said chamber is filled with fluid with the first piston in a position such that it displaces less than its maximum volume, the spring biasing means slides the first piston towards its first position to supply fluid from the chamber to the fluid-filled system when extra fluid is required to maintain the fluid-filled system in a full condition.

8. A fluid reservoir device for connection to and use in conjunction with a fluid-filled system, the fluid reservoir device comprising:

A. A cylindrical chamber wall having an upper end and a lower end;

B. a bottom chamber wall disposed across the lower end of the cylindrical chamber wall, said bottom chamber wall including a mounting shank for attachment to a fluid-filled system and defining an inlet opening through said mounting shank and bottom chamber wall, thereby providing fluid communication from the fluid-filled system through said mounting shank and bottom chamber wall;

C. A first piston slideably mounted between an uppermost position and a lowermost position within said cylindrical chamber wall opposite said bottom chamber wall, said first piston having an annular bottom working surface, said annular bottom working surface having an outer periphery and an inner periphery, the outer periphery being slideably engaged against the cylindrical chamber wall and the inner periphery defining an opening, and a cylindrical wall extending upwardly from the inner periphery of the annular bottom working surface;

D. spring means biasing said first piston downwardly in the cylindrical chamber wall;

E. A second piston slideably mounted between an uppermost position and a lowermost position in the cylindrical wall of the first piston, said second piston having a circular bottom working surface having a outer periphery slideably engaged against the cylindrical wall upstanding from the inner periphery of the annular bottom working surface of the first piston; and

F. Spring means biasing said second piston downwardly in said cylindrical wall of said first piston, said spring means having a higher spring load than the spring means biasing said first piston downwardly within the cylindrical chamber wall.

said cylindrical chamber wall, bottom chamber wall and said first and second pistons defining a chamber closed except for the inlet opening, said chamber having a volume varying according to the positions of the slideably mounted first and second pistons, whereby when the chamber is filled with fluid when the first piston is in its uppermost position, the fluid reservoir device supplies fluid from the chamber to the fluid-filled system as required to maintain the system in full condition by means of spring biased downward movement of the first piston and the second piston mounted therein within the cylindrical chamber wall, and whereby additional fluid forced from the fluid-filled system is accommodated within the chamber by driving the second piston upwardly against its spring biasing means to enlarge the volume of the chamber.

4,000,759

HOSE

Charles D. Higbee, Wheatridge, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Dec. 11, 1974, Ser. No. 531,660

Int. Cl.² F16L 11/12

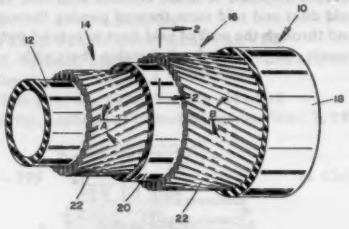
U.S. Cl. 138—130 19 Claims

1. A hose comprising:

a first tube;

a first ply of tubing comprising a plurality of individual tubes spiralled around the first tube, the first ply of tubing defining a first reinforcement ply;

a second ply of tubing comprising a plurality of individual tubes oppositely spiralled radially of and over the first ply



of tubing and defining a second reinforcement ply; and a cover disposed over the second reinforcement ply.

4,000,760

PLASTIC HOSE HAVING EMBEDDED REINFORCING BRAID

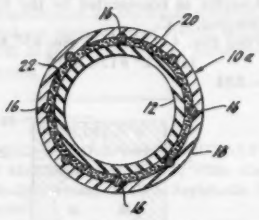
William C. Heller, Jr., Milwaukee, Wis., and Alfred F. Leatherman, Columbus, Ohio, assignors to William C. Heller, Jr., Milwaukee, Wis.

Division of Ser. No. 404,095, Nov. 5, 1973, Pat. No. 3,945,867.

This application Jan. 26, 1976, Ser. No. 652,205

Int. Cl.² F16L 9/12

U.S. Cl. 138—141 10 Claims



1. A composite plastic hose article comprising:

a generally dimensionally stable hollow plastic core suitable for receiving and conveying an internal pressure producing fluid;

a tubular fabric net surrounding the core for reinforcing the core against the pressure of the fluid; and

a layer of thermally softenable material interposed between said core and said net, said material being bondable to the core by thermal fusion but possessing substantial bonding incompatability with said net, said layer being bonded to the core by a thermal fusion bond and having said net at least partially embedded therein for mechanical retention in said layer, said material having uniformly dispersed therein a particulate susceptor having a size range of submicron to 20 microns and heatable upon exposure to a selected form of indirectly applied energy, said layer being applied to said core in a thickness no greater than that which obtains a restraining partial embedment of the net in said layer.

4,000,761

DEVICE FOR CONTROLLING THE SEQUENCE OF MOVEMENT OF INDIVIDUAL HEDDLE FRAMES OF A WEAVING MACHINE

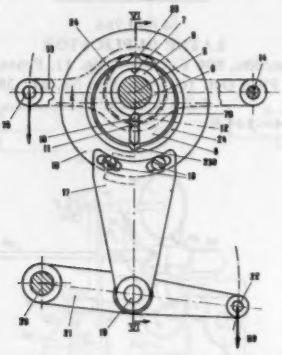
Walter Kleiner, Zurich, Switzerland, assignor to Staeubli Ltd., Horgen-Zurich, Switzerland

Filed June 26, 1975, Ser. No. 590,435

Claims priority, application Switzerland, July 1, 1974, 9016/74

Int. Cl.² D03C *1/00*

U.S. Cl. 139—66 R 9 Claims



1. In a coupling device for controlling the sequential movement of the individual heddle frames of a weaving machine having a rotatable drive shaft, an eccentric ring mounted for free rotation relative to said drive shaft, catch ring means mounted on said rotatable shaft and for rotation therewith, connecting rod means having means defining an opening therein and adapted to rotatably receive said eccentric ring means therein, catch means radially movable toward and away from said catch ring means for effecting a selective connecting of said eccentric ring to said drive shaft and effecting a rotation of said eccentric ring with said drive shaft and a movement of said connecting rod in response to a driven rotation of said eccentric ring, the improvement comprising adjusting means for adjusting the moment in time in a cycle of operation of said machine that said connecting rod is moved.

4,000,762

YARN DRAWING AND MEASURING DEVICE OF A WEAVING LOOM

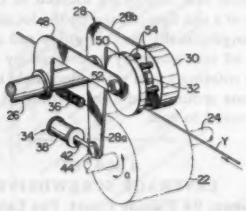
Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Mar. 3, 1975, Ser. No. 555,027

Claims priority, application Japan, May 15, 1974, 49-54205; May 15, 1974, 49-54206

Int. Cl.² D03D *47/34*

U.S. Cl. 139—452 20 Claims



1. A yarn drawing and measuring device for use in a weaving loom, comprising; a measuring roller rotatable about a substantially horizontal axis; pressing means comprising a pressing roller rotatable about an axis substantially parallel to the axis of rotation of the measuring roller, the pressing roller being movable between a first relative position thereof disengaged from said measuring roller and a second relative position thereof in rolling contact with the measuring roller; positioning means for selectively moving said pressing roller into said first and second relative positions, said positioning means having a first condition holding said pressing roller in said first relative position and a second condition holding the pressing roller in said second relative position; and driving means for driving the pressing roller in a direction of rotation opposite to the direction of rotation of the measuring roller at a circumferential speed substantially equal to the circumferential speed of rotation of the measuring roller in either of the relative positions of the pressing roller, said driving means including self-adjustable torque transmission means having at least one deformable member constantly engaging said pressing roller and elastically deformable responsive to the movement of the pressing roller between said first and second relative positions.

4,000,763

METHOD FOR THE PRODUCTION OF CLIPS

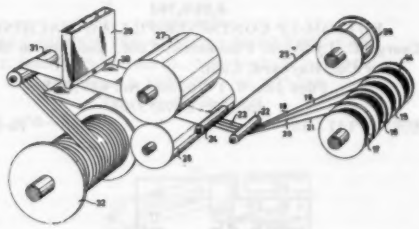
Olof T. Jansson, Skinnskatteberg, Sweden, assignor to Clama Industri Aktiebolag, Skinnskatteberg, Sweden

Filed Apr. 7, 1975, Ser. No. 565,359

Claims priority, application Sweden, May 24, 1974, 7406894

Int. Cl.² B21F *45/24*

U.S. Cl. 140—82 6 Claims



1. A method for the production of clips in the form of piles of U-shaped clips releasably connected to each other, which clips are made of wire of circular cross-section which includes a curved upper part and a pair of straight shanks extending therefrom, comprising the steps of; feeding a plurality of lengths of wire in parallel to each other, to a banding apparatus, and arranging the wires thereat into a wire band wherein the wires are tight and adjacent and parallel to each other, introducing a layer of material such as paper or the like against the wire band thus formed, the layer of material being covered with plastic on its side which faces the wires, said plastic being a thermo-plastic having a melting point which is lower than the temperature at which the layer of material will burn or lose observably its strength, thereafter quickly heating the surface of the wire band turned toward the layer along with the layer of material and the thermo-plastic material up to a temperature at or slightly above the melting temperature of the plastic, and immediately thereafter cooling the wire band and layer of material, cutting the wire/material band into cakes and bending these cakes into clips shape.

4,000,764

STATOR LEAD TERMINATION APPARATUS

Arthur C. Reiger, Jr., Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

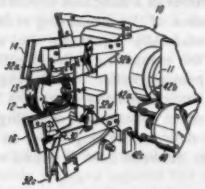
Filed Mar. 27, 1975, Ser. No. 562,861

Int. Cl.² B21F *15/00, 3/02*

U.S. Cl. 140—113 4 Claims

1. Apparatus for terminating a wire extending from a coil

wound about a flux-carrying member on post means projecting outwardly from a wire retainer mounted on said flux-carrying member, said apparatus comprising, in combination, clamp means disposed remotely from said coil for yieldably supporting said wire, said wire extending from said clamp means and alongside said post means to said coil, hook means disposed adajacent said post means for hooking said wire, and means for rotating said hook means about the axis of said post



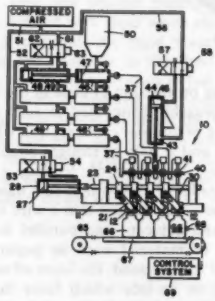
means to engage said hook means with said wire and with continued rotation to cause said hook means to wind said wire about said post means, said means for rotating said hook means causing said hook means to hook wire between said clamp means and said coil, said means for rotating said hook means moving said hook means in a direction which tends to increase the tension in said wire along its length between said coil and said clamp means, said clamp means adapted to yield to such increased tension.

4,000,765

BOTTOM-UP CONTAINER-FILLING MACHINE

George C. Lydiksen, Pleasanton, Calif., assignor to Simplex Filler Co., Hayward, Calif.

Filed Jan. 8, 1976, Ser. No. 647,587
Int. Cl.² B67C 3/02
U.S. Cl. 141—181 **10 Claims**



1. A container-filling machine comprising:

a. conveyor means for moving an open-topped container horizontally to and away from a filling station at said filling machine and for holding said container against horizontal or vertical movement while at said filling station and during a filling operation,

b. a housing member mounted at said filling station a fixed distance above said conveyor means, said housing member having aligned upper and lower openings,

c. a valve member having a fill opening therethrough and being operatively associated with said housing member and movable relative thereto between a first position wherein said lower housing member opening is unobstructed and a second position wherein said lower housing member opening is blocked,

d. a vertically disposed and vertically movable elongated tubular spout extending downwardly into said upper housing member opening, said spout being vertically movable between a first position wherein the lower end of said spout is above said lower housing member opening and a second position wherein the lower end of said spout extends through said valve fill opening and substantially below said lower housing member opening,

e. means for moving said valve member between its first and second positions when said spout is in its first position,

f. means for moving said spout between its first and second position when said valve member is in its first position,

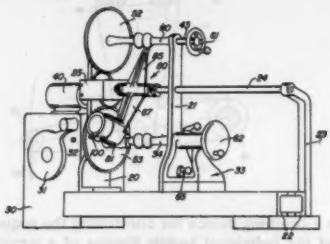
g. means for forcing a measured quantity of fluid through said spout when said valve member is in its first position.

4,000,766

LATHE DUPLICATOR

Brian L. Sutcliffe, 800 E. Center, No. 11, Provo, Utah 84601

Filed Oct. 10, 1975, Ser. No. 621,388
Int. Cl.² B23C 1/18
U.S. Cl. 144—144 R **10 Claims**



1. A duplicator comprising:

first chucking means including a head stock and a tail stock arranged to hold a work piece for rotation around an axis joining said head stock and said tail stock;

second chucking means arranged to mount for rotation around a reference axis a template with a selected surface configuration, the reference axis of said template being parallel the axis of rotation of said work piece;

a guide rail mounted parallel to said axes of rotation and extending substantially the entire work piece capacity of said first chucking means;

a carriage assembly mounted on said guide rail to slide longitudinally along substantially its entire length and to pivot around its axis, said assembly including:

a first arm carrying a sensing probe located to contact said template surface when said assembly is caused to pivot on said guide rail and thereby to limit the degree of pivot of said assembly in accordance with the configuration of said template's surface;

a second arm carrying a router bit and associated drive means to spin said bit around an axis approximately normal to the axis of rotation of said work piece, said bit extending from said second arm in a direction opposite the direction that said sensing probe extends from said first arm and being located to contact said work piece at a site determined by the location of said assembly longitudinally on said guide rail and the degree of pivot of said assembly as defined by said probe; and

means for rotating a said work piece held in said first chucking means around said axis of rotation while said router bit is caused to spin.

4,000,767

LEVERAGE SCREWDRIVER

Jerome F. Geng, 94 Hillside Court, Fox Lake, Ill. 60020

Filed Oct. 9, 1975, Ser. No. 621,009
Int. Cl.² B25G 1/00, 1/12
U.S. Cl. 145—61 L **12 Claims**

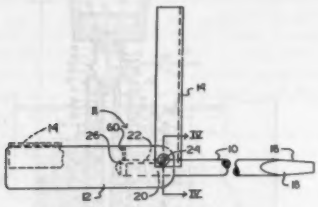
1. A hand tool assembly for turning rotary fasteners, comprising:

a tool having a fastener-engaging end, an end opposite the fastener-engaging end, and an exterior bearing surface extending from said opposite end toward the fastener-engaging end; and

a handle assembly including

an elongate gripping handle with an axial hole at one end thereof receiving therewithin the opposite end of the tool,

an elongate leverage handle, and



a pivot member extending transversely into the axial hole through at least a portion of the gripping handle between one side thereof and the axial hole,

said pivot member being in coupling engagement outside of the axial hole with the leverage handle to secure it and the gripping handle together for relative pivotal movement therebetween and

being in engagement with the bearing surface of the tool within the hole to prevent axial rotary movement of the tool relative to the gripping handle while releasably restraining the tool against separation from the handle.

4,000,768

HANDLE PACKAGE

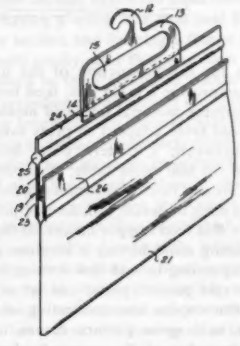
Karl-Heinz Siegel, Nurnberg, Germany, assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Apr. 16, 1974, Ser. No. 461,250

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² A45C *13/26*; **B65D** *33/06, 33/24*

U.S. Cl. 150—3 **4 Claims**



1. A closeable hand-up container including a separable extruded two strip fastener secured to thermoplastic film bag sidewall panels, each fastener strip having separable fastener means to engage closingly with the other, one of the fastener strips including an attachment web secured to one of the bag wall panels and having a carrying web area extending in the opposite direction from juncture of the attachment web and fastener strip, with a one piece handle part welded onto the carrying web area:

said handle part having a horizontally elongated handhole with an overlying hand grip portion provided with a central hanger-bar-receiving hook notch opening downwardly into the handhole;

an entry slot extending from the top of said grip portion to the bottom of said grip portion and generally aligned with the notch opening;

said hand grip portion having grip sections thereof at each side of said notch and said carrying web area having a extruded reinforcement bead rib integral therewith and extending therealong throughout its width adjacently above said juncture and below said handle part.

4,000,769

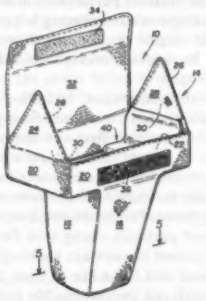
BELT-SUPPORTED CAMERA CARRYING CASE

Bruce J. Katz, 315 E. 86th St., New York, N.Y. 10028

Filed Dec. 3, 1975, Ser. No. 637,166

Int. Cl.² B65D *65/08*

U.S. Cl. 150—52 J **4 Claims**



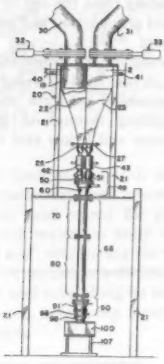
1. A belt-supported camera carrying case comprising an outer fabric enclosure member including walls cooperating to bound a T-shaped storage compartment for said camera having an upper access opening into said storage compartment, a pair of triangular-shaped side flaps formed with pockets therein located for opening and closing movement along opposite sides of said compartment opening, a rear flap located for opening and closing movement over said side flaps along the rear edge of said compartment opening, and a plastic foam insert for said enclosure member including a depending portion having an operative position located about said storage compartment effective to cushion a camera positioned therein against shock, and having triangular-shaped upper portions thereon located to be projected within said pockets of said side flaps, whereby said plastic foam insert is maintained in place within said fabric enclosure member to contribute an external shaping thereto which defines said storage compartment and facilitates the placement of said camera therein.

4,000,770

APPARATUS AND METHOD FOR MANUFACTURING CORES AND MOLDS

Lloyd H. Brown, Crystal Lake; Daniel S. P. Eftax, Barrington, and Joseph N. Kopp, Chicago, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Apr. 21, 1975, Ser. No. 569,827
Int. Cl.² B22C 15/24
U.S. Cl. 164—21 18 Claims



1. Apparatus for forming from a first mass of particulate matter coated with a catalyst-polymerizable resin film and a second mass of particulate matter coated with a catalyst film for polymerizing said resin, a hardened core or mold, said apparatus comprising, in combination:

means including a first staging hopper for storing a quantity of said first mass of particulate matter;

means including a second staging hopper for storing a quantity of said second mass particulate matter;

a core box having an interior void defining said core or mold;

continuous conduit, means, including a conduit, for establishing a continuous, confined flow path for said particulate masses from said first and second staging hoppers to said core box, said conduit means including a mixing section comprising a static mixer for mixing said masses as they pass through said conduit; and

air injection means for establishing a continuous stream-like flow of said particles along said flow path whereby said first and second masses are thoroughly and rapidly intermingled and said films are at least partially integrated to form a catalyzed polymerizable resin-coated particulate mix for deposit directly in said core box.

4,000,771

METHOD OF AND APPARATUS FOR CONTINUOUS CASTING

Calvin C. Williamson, 2083 Mandarin Drive, Costa Mesa, Calif. 92626

Filed July 27, 1973, Ser. No. 383,089
Int. Cl.² B22D 11/00
U.S. Cl. 164—64 12 Claims

1. A method of continuously casting metal comprising:

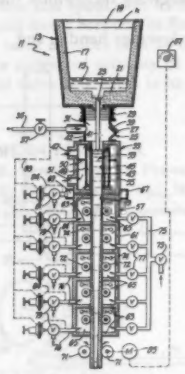
pouring molten metal through a nozzle into a pouring chamber;

flowing the molten metal in a stream through the pouring chamber and into an open-ended mold to form a billet;

controlling the pressure in the pouring chamber to thereby control the flow rate through the nozzle;

cooling the metal in the mold to form a solidified skin on a peripheral region of the billet;

withdrawing the billet from the mold with the metal within the solidified skin being molten; and



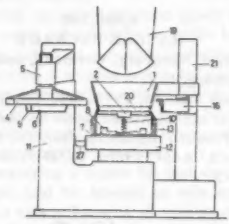
applying external fluid pressure to at least a portion of the billet withdrawn from the mold to prevent the molten metal of such portion of the billet from breaking through the skin.

4,000,772

APPARATUS FOR PRODUCING CASTING MOLDS

Erich Kettler, Mettmann, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Jan. 30, 1976, Ser. No. 653,961
Claims priority, application Switzerland, Feb. 5, 1975, 1476/75
Int. Cl.² B22C 15/02
U.S. Cl. 164—194 10 Claims



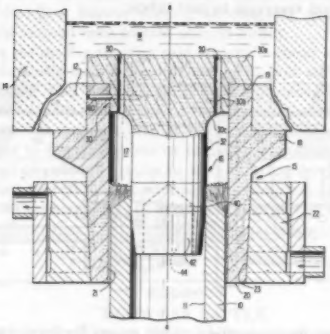
1. Apparatus for the production of the upper part of a casting mold comprising: a mold box; feed hopper means for feeding mold forming material into said mold box; a presser board and a mold table adapted to press said mold forming material therebetween; a pattern plate including pattern means arranged on said mold table; sink pattern means arranged on said presser board for forming a sink in the surface of said mold forming material; at least one premolding member provided on said feed hopper means for forming a depression in said casting mold having a location and dimensions generally corresponding to said sink formed by said sink pattern means on said pattern plate; and sprue pattern means extending to form a sprue communicating said sink with said pattern means, said sprue pattern means including spring means extending substantially perpendicularly to said premolding member and said sink pattern means.

4,000,773

DIE ASSEMBLY FOR CONTINUOUS VERTICAL CASTING OF TUBULAR METALLIC PRODUCTS

Gus Sevastakis, 5645 Angola Road, Toledo, Ohio 43615

Filed Feb. 9, 1976, Ser. No. 656,341
Int. Cl.² B22D *11/10*
U.S. Cl. 164—281 R 7 Claims



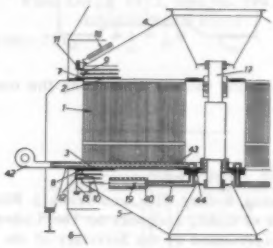
1. For use in the process of vertical continuous casting of metallic tubular products; a die assembly including an outer tubular sleeve having opposite open ends and adapted to be fixed in an opening in a bottom wall of a crucible with one of the ends of the sleeve lying substantially flush with the upper surface of the bottom wall of the crucible, an inner mandrel adapted to be received axially in the sleeve, said mandrel including an upper section for aligning and securing the mandrel in the sleeve and a lower section including a forming section having a transverse dimension less than the transverse dimension of the upper section to provide a mold cavity between the lower section and the sleeve, said upper section having an enlarged head adapted to abut against the upper end of the sleeve to limit the axial position of the mandrel in the sleeve, said upper section below the head including a reduced width section having a width less than said head but greater than said lower section and forming a flange section partially defining the mold cavity, said flange section below the head being dimensioned to form a snug fit within the sleeve, said upper section including a plurality of elongated pouring passages extending longitudinally through said flange section of the upper section and spaced angularly about the longitudinal axis of the mandrel, said passages respectively having inlets at the surface of said head and outlets in the flange section opening into the mold cavity when the mandrel is assembled in the sleeve for permitting molten metal to be fed by gravity through the upper section downwardly into the mold cavity, said sleeve having intermediate sections completely enclosing the mold cavity below the upper section and the forming section of the lower section, and wherein the lower section terminates at a lower free end having an axial cooling recess therein for receiving air to cool the mandrel and the casting during a casting operation.

4,000,774

REGENERATIVE AIR PREHEATER WITH AUTOMATICALLY ADJUSTABLE SEALING DEVICE

Ernst Puritz, Dahlbruch, and Erich Kraft, Huettseifen, both of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Rothemuhle, Germany

Filed Jan. 30, 1973, Ser. No. 328,116
Claims priority, application Germany, Feb. 8, 1972, 2205838
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² F28D *17/00*
U.S. Cl. 165—4 12 Claims



1. Rotary regenerative air preheater with a cylindrical regenerative mass having a central axis and end faces, sealing elements adjacent, respectively, the end faces of the regenerative mass, the sealing elements being operatively linked to spring loaded pin means adapted for travel in the axial direction of the mass and respective stops defining a limit to the travel of the respective pin means, a temperature responsive device at each end face of the mass, each stop being operatively linked to a respective temperature responsive device through a lever linkage including a crank means, the crank means being borne on a support for pivoting about a pivot axis, the temperature responsive devices being attachable to the crank at any one of a plurality of distances from the pivot axis, and being responsive to alter its length will alteration in temperature to adjust axially the position of said stop, the device at one end of the mass being arranged to cause said stop for the sealing element at the end to move in a given axial direction upon temperature rise and that at the other end of the mass being arranged to cause said stop for the sealing element at the end to move in the same axial direction on temperature rise, both stops being moved in the opposite direction on temperature fall, the directiions bein appropriate to the axial movement of the mass with temperature change

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4,000,775

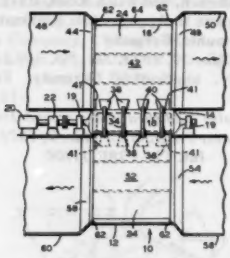
HEAT EXCHANGER STRUCTURE

Albert Eisenstein, Akron, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,138
Int. Cl.² F28D *19/04*
U.S. Cl. 165—8 3 Claims

1. A regenerative heat exchanger comprising a rotatable shaft, a rotor concentrically disposed about said shaft, the rotor having radial partitions forming a plurality of sector shaped compartments and including regenerative heat exchange material disposed within said compartments, a housing surrounding the rotor and having inlet and outlet openings for directing the separate flow of a heating fluid and a fluid to be heated over said heat exchange material, the improvement including said shaft extending through a plurality of annular members rigidly fixed thereto, said members being spaced

from one another and from the ends of the shaft, and notched plates straddling said members and being rigidly fixed thereto



and to said partitions thereby connecting the rotor to said shaft.

4,000,776

HEAT PIPE SYSTEM

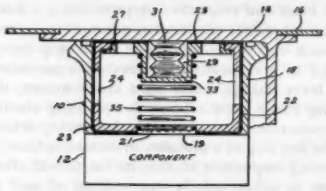
Helmut L. Kroebig, Rolling Hills, and Frank J. Riha, III, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1974, Ser. No. 529,194

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² F28D *15/00*

U.S. Cl. 165—32 **2 Claims**



1. A heat pipe diode device for transferring heat from a heat source component to a heat sink wall comprising: a heat pipe body member attached to said component; said component having a wall forming at least a portion of the normal evaporator section of the heat pipe diode device; a working fluid within said body member; a cover for said heat pipe diode device forming at least a portion of the said heat sink wall; said cover forming the normal condenser for said heat pipe diode device; a wick connected between the condenser and the evaporator of said heat pipe diode device; means for retaining the wick adjacent the heat pipe wall; a wick support plate adjacent said cover; said wick being attached to said support plate; means for holding said wick in contact with said cover; means, responsive to excessive temperatures at said heat sink wall, for moving said support plate and a portion of said wick away from said cover to thereby substantially reduce heat flow in the reverse direction through said heat pipe diode device.

4,000,777

ROTARY HEAT EXCHANGER

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Continuation-in-part of Ser. No. 418,550, Nov. 23, 1973, abandoned. This application Sept. 10, 1974, Ser. No. 504,769

Claims priority, application Austria, Nov. 23, 1972, 9968/72

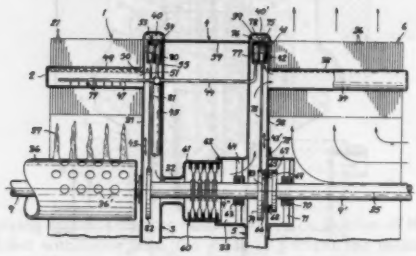
Int. Cl.² F28F *5/00*; **F22B** *5/00*; **F25B** *3/00*

U.S. Cl. 165—86 **11 Claims**

1. In a heat exchanger for a thermodynamic machine, comprising a rotary unit with an evaporator section, a condenser section and conduit means establishing a closed circuit for the passage of a working fluid in a vaporized state from said evaporator section via a thermo-mechanical energy converter to said condenser section and in a liquefied state from said condenser section to said evaporator section, said evaporator section including an array of tubes parallel to the axis of rotation of said unit, the improvement wherein said rotary unit further includes:

an annular collector centered on said axis, said collector forming a receptacle disposed radially outwardly of said array of tubes;

a reservoir for working-fluid condensate communicating via a first part of said conduit means with said condenser section, a second part of said conduit means extending from said reservoir to said tubes;



circulation means in said conduit means for driving condensate from said reservoir into said tubes at a mass-flow rate exceeding the mass-flow rate of the evolving working-fluid vapors, said tubes having entrance ends partially obstructed by barriers located adjacent peripheral sectors thereof remote from said axis, said barriers defining storage areas for centrifugally retaining excess condensate, said collector communicating with said entrance ends for receiving an overflow of said excess condensate from said storage areas and transmitting said overflow to said receptacle by centrifugal action; and

return means for delivering said overflow from said receptacle to said second part of said conduit means for recirculation to said tubes together with fresh condensate from said condenser section.

4,000,778

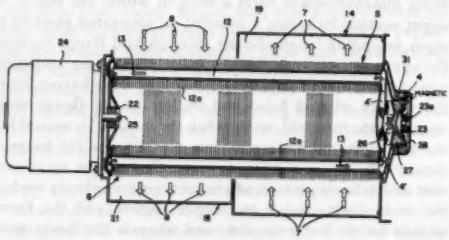
TEMPERATURE-CONTROL SYSTEM WITH ROTARY HEAT EXCHANGERS

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen, Germany

Division of Ser. No. 286,569, Sept. 5, 1972, Pat. No. 3,877,515, and a continuation-in-part of Ser. No. 847,771, June 17, 1969, abandoned. This application Feb. 10, 1975, Ser. No. 548,674

Int. Cl.² F28D *11/04*

U.S. Cl. 165—86 **6 Claims**



1. A temperature-control system for ventilating a room equipped with means for maintaining the air therein at a

temperature differing substantially from that of the outer atmosphere, comprising:

stationary support means including a housing divided into a first compartment and a second compartment, said first compartment having a first inlet open to the outer atmosphere and a first outlet open to said room, said second compartment having a second inlet open to said room and a second outlet open to the outer atmosphere;

a rotary structure in said housing comprising a first and a second heat exchanger mounted for joint rotation about a common axis in said first and said second compartment, respectively, said first heat exchange being a radial-flow blower driving an incoming airstream from said first inlet to said first outlet, said second heat exchanger being a radial-flow blower driving an outgoing airstream from said second inlet to said second outlet;

drive means for rotating said structure about said axis;

hermetically sealed conduit means in said structure interlinking said heat exchangers and forming at least one closed path for a heat-carrier medium abstracting heat from the warmer one of said airstreams and giving off heat to the colder one of said airstreams; and

forced-circulation means in said path for driving said medium therethrough under a pressure maintaining a continuous uninterrupted flow of said medium at substantially uniform speed between said heat exchangers.

4,000,779

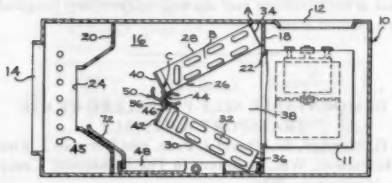
BLOWOFF BAFFLE

John W. Irwin, Trenton, N.J., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 28, 1975, Ser. No. 635,859

Int. Cl.² F25D *21/14*

U.S. Cl. 165—111 **7 Claims**



1. An air handling structure including a housing having a heat exchanger arranged in the path of a flow of air, a drip pan means in said housing arranged below said heat exchanger for receiving condensate from said heat exchanger, comprising:

said heat exchanger including a pair of generally horizontally extending slab heat exchangers arranged one above the other, each having a first upstream and a second downstream axial ends;

said first ends being substantially parallel and spaced from each other to define an opening therebetween to allow movement of air therethrough, and converging axially toward said second ends so that substantially all of the air moving through the opening contacts the heat exchangers;

air deflector means of substantially diamond shape connecting said second ends of said heat exchanger and extending laterally relative to the air flow path substantially the full width of said heat exchangers;

a condensate guide means extending substantially the full width of said air deflector means including a condensate collecting portion and a tab portion formed along one edge, said tab portion being arranged between said deflecting means and the second end of the lower heat exchanger so that said collecting portion projects axially upstream from said heat exchanger;

baffle means on said collecting portion formed along the other edge of said air guide means extending upwardly into the path of air passing through the lower portion of the upper heat exchanger so that when condensate in said lower portion of the upper heat exchanger is sufficient to be carried by said air flow through said heat exchanger, it impinges on said baffle means and said collecting portion and is directed to said drip pan thereby preventing said condensate from being carried out of said housing by said air flow.

4,000,780

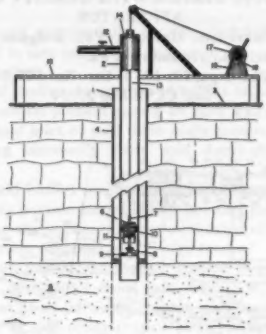
STORM CHOKE

Gary W. Rosenwald, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Oct. 3, 1972, Ser. No. 294,743

Int. Cl.² E21B *43/12*

U.S. Cl. 166—72 **9 Claims**



1. In a producing well having a production tubing which extends below the surface to a producing reservoir, apparatus for controlling flow of fluid through the production tubing which comprises:

a. a valve seat located within the production tubing,

b. an operable valve disc located within the tubing, the disc being adapted to engage and mate with the valve seat,

c. operating means for continuously urging the valve disc to move toward a position which is opposite from normal with regard to engagement of the disc with the valve seat, and

d. mechanical means for selectively securing the valve disc in a normal position with regard to engagement with the seat and for releasing the disc for movement by the operating means, and wherein said mechanical means comprises a mechanical linkage attached to the disc and which extends up through and out of the production tubing and is adapted for movement within the tubing, and further comprising means at the surface for selectively securing and moving the mechanical linkage within the tubing.

4,000,781

WELL TREATING PROCESS FOR CONSOLIDATING PARTICLES WITH AQUEOUS EMULSIONS OF EPOXY RESIN COMPONENTS

Randolph H. Knapp, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 571,195, April 24, 1975, abandoned. This application Nov. 13, 1975, Ser. No. 631,774

Int. Cl.² E21B *33/138*, *43/04*

U.S. Cl. 166—276 **21 Claims**

15. The process for coating solid surfaces with a solution of epoxy resin-forming components which become converted to

a solid resin while those surfaces are disposed within a relatively remote and relatively hot subterranean location which process comprises:

compounding an oil-phase liquid solution of a polymerizable polyepoxide and a relatively water-soluble tertiary amine that is capable of both catalyzing the polyepoxide polymerization and oil-wetting a solid surface;

dispersing said solution in an aqueous liquid to form an oil-in-water cationic emulsion that is capable of wetting solid surfaces with a resin-forming solution that will subsequently form a solid resin;

contacting the solid surfaces to be treated with said emulsion so that they are wetted with the resin-forming solution; and

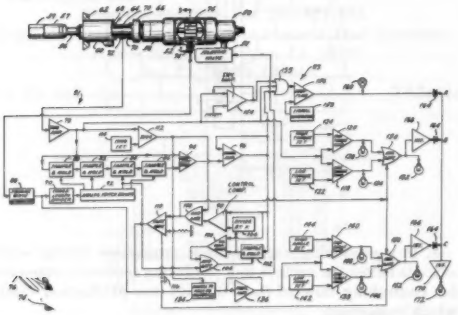
disposing the so-wetted solid surfaces within said relatively remote and relatively hot subterranean until the solid resin is formed.

4,000,782

TIGHTENING SYSTEM WITH QUALITY CONTROL APPARATUS

Robert J. Finkelston, Hatboro, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Sept. 19, 1974, Ser. No. 507,546
Int. Cl.² B25B *23/14*
U.S. Cl. 173—12 **15 Claims**



1. A tightening system for tightening a fastener to a predetermined tightened condition including wrench means for imparting input tightening characteristics to said fastener, control means operatively associated with said wrench means for shutting off said wrench means at said predetermined tightened condition, means associated with said wrench means for measuring said input tightening characteristics and providing first signals indicative of the instantaneous values thereof, means for providing second signals representative of desired instantaneous values of said input tightening characteristics at said predetermined tightened condition, means for providing a third signal representative of a desired operating characteristic of said system when said wrench means and said control means are functioning properly, and quality control means for continuously checking said first signals with respect to said second signals and for continuously checking sad operating characteristic of said system with respect to said third signal.

4,000,783

CONICAL BORING TOOL

Hans Albert Hug, Weston, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Oct. 20, 1975, Ser. No. 623,807
Int. Cl.² E21B *9/10*
U.S. Cl. 175—346 **11 Claims**

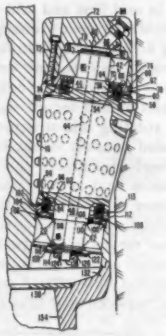
1. A self-advancing conical boring tool comprising:

a. a tapered frame formed with a plurality of circumferentially disposed recesses;

b. a pair of self-aligning spherical roller bearing mounted within each of said recesses;

c. a roller cutter supported in each said pair of spherical roller bearings, each said roller cutter having a wide upper portion and a narrow lower portion constituting a frusto-conical body and a shaft, a longitudinal axis of said body coaxial with a longitudinal axis of said shaft, one end of said shaft received in one of said pair of spherical roller bearings and an opposite end of said shaft received in the other of said pair of spherical roller bearings;

d. a thrust plate interposed between said wide upper portion of each said roller cutter and said one of said pair of



spherical roller bearing, said spherical roller bearings constituting primary bearings, said thrust plate constituting a secondary bearing when said one of said pair of spherical roller bearings fails; and

e. a plurality of teeth projecting outwardly from the periphery of each said roller cutter;

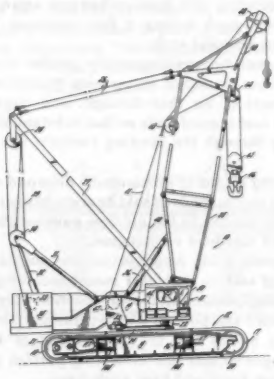
f. each said roller cutter constrained within each said pair of spherical roller bearings for free rotation about an axis that is both oblique and skewed relative to a longitudinal axis of said frame.

4,000,784

DEMOUNTABLE SELF-PROPELLED CRANE TRANSPORT ASSEMBLY

James G. Morrow, Sr.; David J. Pech, and Norman J. Kutz, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Apr. 24, 1975, Ser. No. 571,303
Int. Cl.² B62D *55/00*
U.S. Cl. 180—9.48 **7 Claims**



1. A demountable self-propelled transport assembly for a load handling vehicle comprising, in combination, a central

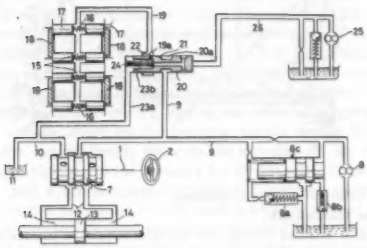
body portion, a pair of transverse beams connected respectively to the front and rear of said body portion and extending laterally from the sides thereof, said connection between said body portion and each of said beams including at least one hydraulically actuated lock pin selectively connected to a hydraulic supply means for selective actuation thereby, a pair of side frames each coupled to the projecting ends of said beams in load bearing relation on opposite sides of said body portion, means for detachably connecting said frames to said beams, a crawler assembly mounted on each of said side frames, jack means mounted on said transverse beams for selectively relieving the load imposed on said side frames by said beams, lateral adjusting means interconnecting said beams and frames for shifting said frames relative to said beams, and means for selectively energizing said jacks and adjusting means to shift said side frames relative to said beams.

4,000,785

POWER STEERING APPARATUS FOR A VEHICLE

Masao Nishikawa, Niiza; Yoshihiko Toshimitsu, and Takashi Aoki, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1975, Ser. No. 602,518
Claims priority, application Japan, Aug. 7, 1974, 49-89811
Int. Cl.² B62D *5/08*
U.S. Cl. 180—143 **4 Claims**



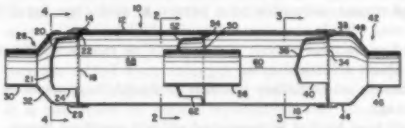
1. Power steering apparatus comprising a turnable steering shaft, a pressure fluid source, a power cylinder having left and right chambers, a supply passage connected to said source, movable changeover valve means coupled to said steering shaft for selectively connecting the left and right chambers to said passage and thereby to said source depending on the direction of turning of the steering shaft, at least one fluid pressure reaction chamber, a further passage connecting said reaction chamber to said changeover valve means for opposing displacement of the changeover valve means, first throttle means between said further passage to said fluid pressure reaction chamber and said supply passage, an exterior oil tank, second throttle means between said passage to said fluid pressure reaction chamber and said exterior oil tank, and control means for varying the size of at least one of said throttle means in proportion to vehicle speed thereby to increase the ratio of the size of the opening areas of the first and second throttle means to said further passage according to increase of vehicle speed, said control means comprising a linearly displaceable control valve, one of said throttle means being constituted as a variable area passage formed in said control valve, the other of said throttle means being constituted as a constant area passage formed in said control valve, said control means further comprising a pump having a delivery pressure corresponding to vehicle speed for moving said control valve in accordance with vehicle speed, thereby to vary the ratio of the sizes of said first and second throttle means to said further passage.

4,000,786

MARINE MUFFLER

John R. Ford, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Nov. 3, 1975, Ser. No. 628,378
Int. Cl.² F01N *1/08*
U.S. Cl. 181—52 **3 Claims**



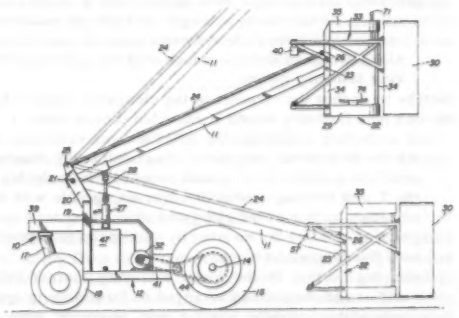
1. A marine muffler comprising:
an elongated, substantially tubular main body section,
a pair of apertured end caps mounted over opposite ends of said main body section and defining an inlet and an outlet thereto,
a plurality of substantially similar, dome-shaped baffles mounted in said main body section in spaced relationship to each other,
each of said similar, dome-shaped baffles including a dome-shaped central portion having an apex thereof projecting toward said inlet of said main body section and a flange projecting outwardly from said dome-shaped central portion,
a first of said baffles positioned adjacent said inlet to said main body portion having a first opening formed through said dome-shaped central portion thereof and a lower, cut away portion adjacent said flange thereof,
a second of said dome-shaped baffles being positioned adjacent said outlet from said main body section and having cut away portion adjacent said flange thereof,
a third one of said dome-shaped baffles being mounted in said main body section intermediate said first and second dome-shaped baffles and dividing said main body section into upstream and downstream expansion chambers,
means defining an opening through the apex of said third dome-shaped baffle and a cut away portion adjacent the flange thereof, and
a substantially cylindrical connecting tube mounted within said opening in said third one of said dome-shaped baffles and projecting into said upstream and downstream expansion chambers.

4,000,787

VEHICLE FOR PICKING FRUIT

Robert E. Groenig, 8505 Tieton Drive, Yakima, Wash. 98902

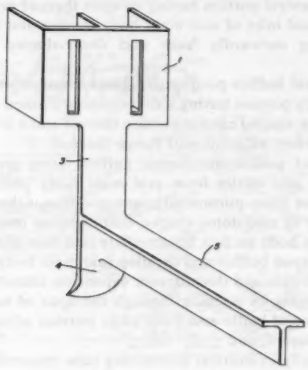
Filed Sept. 16, 1974, Ser. No. 506,273
Int. Cl.² B66F *11/04*
U.S. Cl. 182—2 **6 Claims**



1. A machine comprising a frame, said frame having an intermediate part and two spaced rearwardly extending rear parts,
a caster wheel fixed to said forwardly extending part,

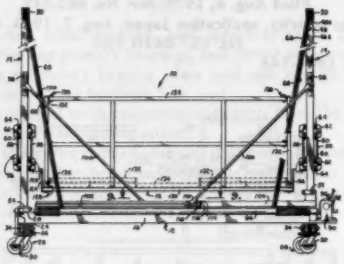
rear wheels fixed to said rearwardly extending parts,
a boom pivoted to said frame above said caster wheel and extending rearwardly therefrom,
a cage fixed to the distal end of said boom,
link means disposed generally parallel to said boom connected to said frame and to said cage whereby said cage is held to move in a vertical direction,
means for swinging said boom up and down,
and means accessible to a person in said cage for driving said wheels and steering said vehicle,
and an auxiliary boom is supported on said boom to swing about a vertical axis,
wherein said auxiliary boom is swingably supported on said cage,
a picking bucket is supported on said auxiliary boom.

4,000,788
BELT-ON TREE STEP (BOTS)
John Alwyn Burgess, 114 Moore Ave., and Zeb Douglas Schofield, III, 273 Champion Drive, both of Opp, Ala. 36467
Filed Nov. 11, 1975, Ser. No. 630,153
Int. Cl.² B60R *3/00*
U.S. Cl. 182—92 **1 Claim**



1. A portable step for climbing up and down elongated objects such as trees and poles, comprising,
a one-piece member formed as an integral casting and having
a first vertical leg portion which is T-shaped in cross-section with the leg of the T forming an abutment edge to abut against the adjoining surface of the elongated object to be climbed and with the cross arms of the T spaced outwardly thereof,
said cross arms of the T at an upper portion of said vertical leg portion being enlarged to form an anchoring means and having formed therein a pair of spaced apart elongated slots through which may be passed a belt-type fastening means,
thereby to anchor the member to the elongated object when the belt-type fastening means is encircled therearound,
said anchoring means having offset flanges extending inwardly towards the elongated object and being disposed generally parallel to but spaced outwardly from the leg of the T and forming abutment edges engageable with the adjoining surface of the elongated object at spaced apart points to stabilize the member by multi-point engagement with the elongated object,
said leg portion at the lower extremity thereof being offset and shaped and arranged to form a sharp spike extending inwardly beyond said abutment edge to embed itself into the adjoining surface of the elongated object,
said one-piece member having a second generally horizontal leg portion which is also T-shaped in cross-section with the leg of the T extending downwardly and the cross arms of the T forming a flat step to support the foot of the user,
said horizontal leg portion being inclined angularly upwardly sufficiently to prevent inadvertent foot slippage of the user,
said horizontal leg portion being connected to said vertical leg portion immediately superjacent the level of said spike and well below the level of said anchoring means,
whereby the step will not twist to the side when the user places his weight thereon.

4,000,789
PORTABLE SCAFFOLD
Louis J. Zahner, Kansas City, Kans., assignor to Edward Engel, Kansas City, Kans., a part interest
Filed Feb. 18, 1976, Ser. No. 659,097
Int. Cl.² E04G *1/18, 1/34*
U.S. Cl. 182—152 **14 Claims**

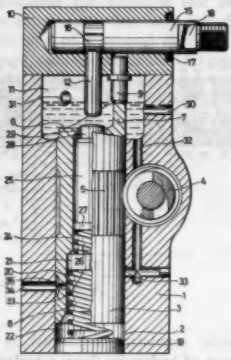


1. A lifting device comprising:
a base framework;
first and second elongated upright supports pivotally coupled with said framework in spaced apart relationship,
each of said supports being movable from a collapsed position in generally horizontal disposition to an extended position in generally vertical disposition;
first and second platform supporting means for raising and lowering an object,
said means being mounted on said first and second upright supports, respectively, for movement longitudinally therealong between raised and lowered positions when said supports are in their extended positions;
a platform member substantially spanning the distance between said supports and adapted to be coupled therewith;
means for mounting one end of said member on each of said platform supporting means,
each of said mounting means comprising a bracket presenting a coupling with said supporting means for accommodating pivotal movement of said supporting means relative to said platform mounting means for approximately 90°, an elongate section extending away from said pivotal coupling and means coupled with said elongate section for coupling with said platform member whereby the latter may be lowered to a plane lying below the plane of the pivotal point of one of said supports a distance at least equal to the width of the other of said upright supports; and
means coupled with said platform supporting means for moving the platform member up and down along said upright supports.

4,000,790
LUBRICANT PROPORTIONING PUMP

Theo Seufer, Bad Wimpfen, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed Dec. 11, 1974, Ser. No. 531,545
Claims priority, application Germany, Dec. 14, 1973, 2362194
Int. Cl.² F16N 7/40, 13/04
U.S. Cl. 184—27 R 6 Claims

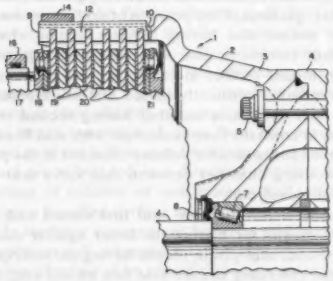


1. A lubricant proportioning pump comprising a housing, a bore in said housing, a delivery piston mounted in said bore for reciprocating and rotary motion, said bore having a closed end, a working chamber between said closed end and an endface of the piston, said working chamber having an inlet port controlled by the piston and an outlet port, a step-down transmission for rotating the piston about its longitudinal axis, cam means for reciprocating the piston during its rotary motion, said cam means comprising a cam track member cooperating with a guide member, one of said members being on the piston and the other on the housing, spring means for urging the piston longitudinally towards the member on the housing, an adjustable stop in the housing for limiting the stroke of the piston, and a temperature-responsive expansion element arranged in the piston for cooperation with said stop at the end of the piston stroke, said expansion element being expandible towards said stop on increasing temperature of the lubricant for reducing the piston stroke.

4,000,791
DISK BRAKE FOR REINFORCED DRIVE KEY MEMBER

James J. Kovac, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Apr. 21, 1976, Ser. No. 678,837
Int. Cl.² F16D 55/36
U.S. Cl. 188—71.5 11 Claims



1. A disk brake comprising:

A. A circular flange having a plurality of axially extending keyslots therein;

B. said keyslots being open at one end thereof;

C. a plurality of stationary disks;

D. a plurality of rotatable disks interleaved between the stationary disks;

E. each rotatable disk having a plurality of radially directed keys mating with the keyslots in the flange in such manner that the sides of the keyslots take torque exerted thereon by the rotatable brake disks upon brake application;

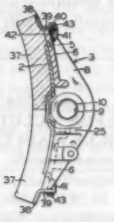
F. means to move the disks axially into frictional engagement with each other; and

G. bridge means spanning the open end of the keyslots to provide added hoop strength to the circular flange and prevent the flange from bending radially outwardly when it is subjected to high temperatures and torque loads during braking or rolling loads while the brake is hot.

4,000,792
BRAKE SHOE AND HEAD ASSEMBLY

David R. Guldin, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 28, 1975, Ser. No. 608,561
Int. Cl.² F16D 65/06
U.S. Cl. 188—242 2 Claims



1. A brake head and brake shoe assemblage for use in a railway vehicle brake apparatus, said assemblage comprising:

a. a brake head having a concave brake-shoe-receiving surface, a back and a pair of parallel spaced-apart webs integral with and extending outward from said back,

b. a brake shoe, and

c. a backing plate having said brake shoe secured thereto, wherein the improvement comprises locking means for locking said backing plate to said brake head, said locking means comprising:

d. a pair of apertured tabs formed integral with the respective opposite ends of said backing plate,

e. a pair of internally-threaded locking elements each separately secured to one of the opposite ends of said back of said brake head, and

f. a pair of cap screws each extending through the aperture in one of said tabs and having screw-threaded engagement with the internal screw threads in the corresponding locking element whereby said pair of cap screws releasably secure said brake shoe to said brake head.

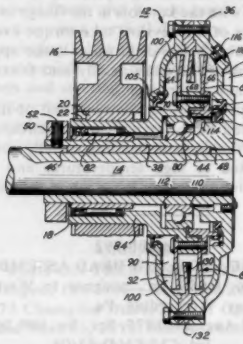
4,000,793
DRY FLUID DRIVE

Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Apr. 30, 1975, Ser. No. 573,316
Int. Cl.² F16D 37/00
U.S. Cl. 192—105 A 11 Claims

1. A dry fluid drive comprising a housing having a center axis about which said housing rotates and a cavity therein concentric with said housing, a dry fluid in said cavity, a rotor assembly disposed in said cavity having a hub in alignment with the center axis of said housing and extending axially from the housing, said rotor having two sections in axially spaced relation at the periphery, and a reaction vane of generally

annular configuration disposed between said rotor sections extending inwardly from the periphery of the cavity and having a plurality of spaced slots in the inner edge thereof, producing a series of equally spaced vane segments with openings



therebetween for distributing said dry fluid in said cavity between said rotor sections and said vane, said vane having an effective surface of an undulated configuration with the ribs and grooves being generally radially disposed.

4,000,794

CONTROL MEMBER FOR A CLUTCH DISK OF A MOTOR VEHICLE MAIN CLUTCH

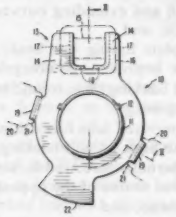
Günter Wörner, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 16, 1974, Ser. No. 515,340

Claims priority, application Germany, Oct. 17, 1973, 7337305[U]

Int. Cl.² F16D *69/00, 3/14*

U.S. Cl. 192—106.2 **19 Claims**



1. A control structure for a clutch disk of motor vehicle main clutches in which a disk means carrying friction linings and a lateral member rigidly connected therewith are operatively connected torsionally elastically with a flange of a hub means, and in which several spring means of different characteristics are retained in window means of one of the two parts torsionally elastically connected with each other and engage in window means provided in the other of said two parts, and in which damping means are provided with the start of operation of at least one damping means being determined by a control means, characterized in that the control means includes an approximately radially extending fork-like arm whose two fork ends are bent over at their radial edges as viewed in the axial direction and therewith enclose a control spring, in that the tab means formed by the bent over portions of the fork ends are supported at the radially inner ends with respect to the control means, and in that offset in the direction of rotation with respect thereto are provided axial, angularly bent portions for engagement in corresponding window means of the hub flange means.

4,000,795

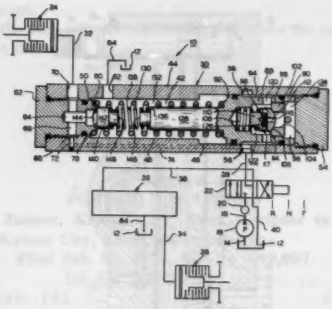
APPARATUS FOR CONTROLLING THE PRESSURE OF A FLUID FED TO A CLUTCH

Jon R. Patton, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 29, 1976, Ser. No. 671,526

Int. Cl.² F16D *25/062;* **F16K** *17/04*

U.S. Cl. 192—109 F **14 Claims**



8. In a hydraulic regulating apparatus, in combination, a reservoir; a source of hydraulic fluid; a hydraulic clutch having driven elements and driving elements operative to transmit torque to driven elements in response to fluid pressure; conduit means connecting said source with said clutch; and valve means interposed between said source and said hydraulic clutch for regulating the pressure which is admitted to said hydraulic clutch so that said pressure rises from a minimum to a maximum value within a predetermined interval of time (1) initially at the same rate as said source pressure; (2) then at a lesser rate than said source pressure; and (3) finally again at the same rate as said source pressure, said valve means comprising:

a. an elongated housing having a through chamber with first and second closed ends, said chamber having at least one inlet port, a discharge port, an outlet port and first restriction means;

b. said first closed end having a first bore in communication with said outlet port, said outlet port communicating via said conduit means with said friction clutch, said first bore also being operatively connected with said first restriction means and in turn via said conduit means with said source of hydraulic fluid, said first closed end also having a second bore in communication with said first bore and said housing chamber;

c. piston means sealingly and slidingly retained within said housing chamber adjacent said second closed end, said piston means including an annular groove portion which is in constant contact with said inlet port and said conduit means regardless of the position of said piston means, said piston means also having a fixed volume chamber in constant communication with said groove portion, said piston means further including a valve seat and a first valve member resiliently biased into engagement therewith, said first valve member having second restriction means in constant communication with said fixed volume chamber and a variable volume chamber in the portion of said housing chamber between said valve seat and said second closed end;

d. resilient means between said first closed end and said piston means for biasing the latter against said second closed end, said piston means having an axial piston rod portion extending toward said first closed end; and

e. a second valve member resiliently biased into sealing engagement with one end of said second bore, whereby fluid pressure flows initially through said first closed end to said hydraulic clutch at the same rate as said source

pressure and flows from said fixed volume chamber through said second restriction means into said variable volume chamber so as to begin to advance said piston means against the bias of said resilient means; then, after a predetermined first time at a predetermined first pressure, said pressure fluid translates said second valve member away from said open end, thereby venting some of said pressure fluid passing through said first closed end into said chamber and out through said discharge port, thereby increasing the pressure rise in said hydraulic clutch at a lesser rate than said source pressure; and finally at the end of a second predetermined time at a predetermined second pressure, said piston rod portion has physically translated said second valve member into sealing relationship with said one end of said second bore, thereby increasing the pressure rise in said hydraulic clutch at the same rate as said source pressure.

4,000,796

BRAKING DEVICE

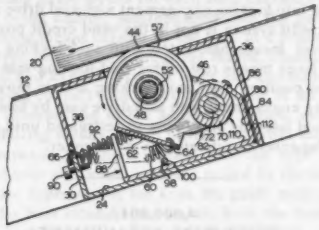
Frederick Arthur Bolton, Hamilton, and James Louis Eckebrecht, Burlington, both of Canada, assignors to Arcan Eastern Limited, Hamilton, Canada

Filed May 23, 1975, Ser. No. 580,379

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² B65G *13/00, 39/00*

U.S. Cl. 193—35 A **13 Claims**



1. A braking device for retarding moving objects comprising, in combination: a housing, a primary roll journalled within said housing having a peripheral surface projecting from said housing adapted to be frictionally engaged by said moving object for rotation of said roll thereby, a secondary roll, means journalling said secondary roll within said housing and means normally biasing said secondary roll journal means in a direction opposite to normal direction of rotation of said primary roll, a pressure plate slidably mounted within said housing for reciprocal travel towards and away from the peripheral surface of said primary roll, means for biasing said pressure plate against said secondary roll in a direction opposite to the normal direction of rotation of said primary roll, said pressure plate having a bevelled surface adapted to receive said secondary roll in wedging engagement between said pressure plate and said primary roll, whereby rotation of said primary roll in the direction of travel of an object thereon rotates said secondary roll in the opposite direction for frictional engagement with said pressure plate bevelled surface and wedging of the secondary roll between said primary roll and said pressure plate bevelled surface for retarding the rotation of said primary roll.

4,000,797

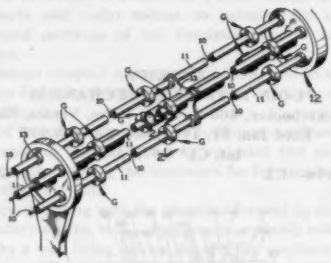
NOISE-ABSORBING BAR STOCK GUIDE FOR SCREW MACHINE

Paul Ducanis, 17401 NW. 2nd Ave., Miami Shores, Fla. 33169

Filed June 2, 1975, Ser. No. 582,678

Int. Cl.² B23B *25/00;* **B23Q** *3/00*

U.S. Cl. 193—38 **9 Claims**



1. In a bar stock feeding arrangement for a screw machine which has an elongated guide tube defining a passageway at the inlet side of the machine for loosely receiving the bar stock, an improved bar stock guide comprising:

a plurality of rollers spaced apart circumferentially around said passageway and each having an axle;

and yieldable, resilient support means of rubber-like material with recesses therein which snugly receive the roller axles and positioning said rollers extending into said passageway for guiding the bar stock between them.

4,000,798

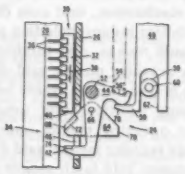
INERTIAL ARRESTING DEVICE FOR FEEDER

Nicholas J. Cedrone, Daymarc Corporation, 40 Bear Hill Road, Waltham, Mass. 02154

Continuation of Ser. No. 457,811, April 4, 1974, abandoned. This application July 16, 1975, Ser. No. 596,304

Int. Cl.² B65G *11/20*

U.S. Cl. 193—40 **4 Claims**



1. In apparatus for successively placing discrete articles in and removing them from a first position on a support without an upward bounce from the support and at a high repetition rate and where the articles successively approach said first position in a substantially free fall from a second position substantially vertically above said first position, the combination comprising,

impact retarding means positioned and adapted for a first, substantially elastic, impact by each falling article, thereby acquiring a kinetic energy variable directly with the mass of said article and a horizontal velocity component that is greater for articles of greater mass than for articles of lesser mass,

friction retarding means having a substantially vertical surface adjacent the path of fall of the articles after impact and positioned so that the impact retarding means upon a second impact with the article as it falls to said first position, causes the article to bear frictionally on said surface with a force directly related to said velocity component, and

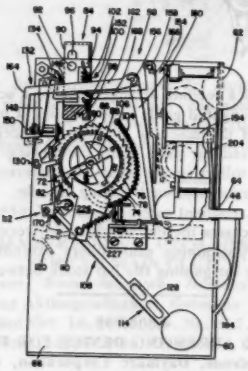
a fixed abutment that reverses the direction of the horizontal velocity component of the impact retarding means.

4,000,799

COIN TOTALIZER MECHANISM

Karl Knickerbocker, 400 Baycrest Drive, Venice, Fla. 33595

Filed Jan. 12, 1976, Ser. No. 648,573
Int. Cl.² G07F 5/08
U.S. Cl. 194—1 L **24 Claims**



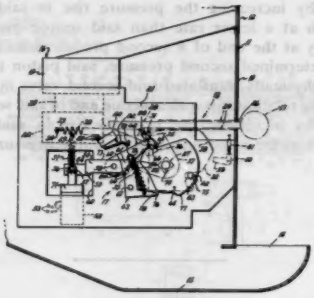
1. A coin controlled mechanism including a coin controlled mechanism housing for use in combination with a dispensing machine including an access door having a latch means attached to permit dispensing of products from the dispensing machine upon receipt of a predetermined amount of coins in said coin controlled mechanism, said coin controlled mechanism comprising a totalizer means including a totalizer register means and a coin chute means, said totalizer register means including a dispenser actuator means, said dispenser actuator means and said latch means each movable between a dispensing and non-dispensing position, said totalizer means also including a totalizer operator means operatively interconnected to said totalizer register means, said dispenser actuator means disposed to engage said latch means to control movement of said latch means from said non-dispensing to said dispensing position, said totalizer means including a totalizer actuator means, said totalizer actuator means movable between a first and second position in response to coins passing through said coin chute means, said totalizer actuator means disposed to selectively engage said totalizer operator means to control movement thereof in response to coins passing through said coin chute means and a totalizer control means comprising a first actuator stop means having a first position disposed to engage said totalizer actuator means to control movement thereof, said coin chute means comprising a single coin passage to control the travel of coins inserted therein, said first actuator stop means being disposed to engage said totalizer actuator means when in said first position in response to coins passing through said coin chute means to selectively control the extent of movement of said totalizer operator means and said totalizer register means relative to said dispenser actuator means to control said latch means whereby said totalizer means advances incrementally to permit movement of said latch means to said dispensing position when the proper combination of coins is registered by said totalizer register means.

4,000,800

ELECTROMECHANICAL INTERLOCK DEVICE FOR A VENDING MACHINE

Wesley T. Loucks, Sr., Cincinnati, Ohio, assignor to William F. Shepherd, Inc., Cincinnati, Ohio

Filed Oct. 9, 1975, Ser. No. 621,218
Int. Cl.² G07F 5/10
U.S. Cl. 194—9 R **6 Claims**



1. An electromechanical interlock device adapted to interconnect an electric credit system with a mechanical product dispenser, said interlock device including

a drive cam adapted to be moved from a home position to a vend position upon operation of said product dispenser, said drive cam having structure that defines a lock notch,

a locking arm movable into and out of locking relation with said drive cam's lock notch,

an electrically operated solenoid interconnected with said electric credit system, said solenoid and said locking arm being connected together in a manner that permits said locking arm to be moved out of locking engagement with said drive cam when said credit system achieves the vend credit position, and that permits said locking arm to be moved into locking engagement with said drive cam when said credit system is not in the vend credit position, and

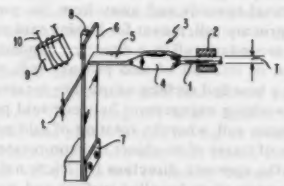
latch lever means associated with said locking arm, said latch lever means restraining said locking arm in an unlocked position after said locking arm is moved out of locking engagement with said drive cam by said solenoid, and said latching arm being so restrained until said product dispenser is activated by a customer.

4,000,801

PRINT WIRE ATTACHMENT

Heard Kilpatrick Baumeister, Durham; Robert Allen Sebrosky, and Walter Rudolph Wagner, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 425,344, Dec. 17, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,225
Int. Cl.² B41J 3/04
U.S. Cl. 197—1 R **2 Claims**



1. In wire matrix print head apparatus having an electromagnetic wire driving means for reciprocating the wire be-

tween an operative print position and a retracted position, said driving means being adapted to move in a slightly arcuate path, thereby producing thrusting and bending movements and further having means connecting said thrusting and bending motions of said driving means to said wire, the improvement comprising:

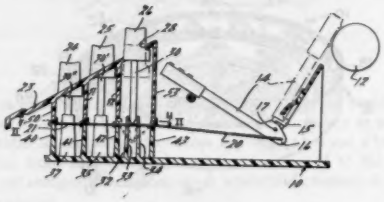
said connecting means is a unitary flexible hinge of a single piece of material directly connecting said driving means to said wire means, said connecting means having at least a first portion thereof that is more flexible in the plane of bending induced in said wire by said driving means than said wire alone in said same plane of bending, thereby reducing said bending moment induced in said wire.

4,000,802

TYPE BAR ACTUATING MECHANISM

James E. Thomson, Pleasant Lake, Mich., assignor to Western Stamping Corporation, Jackson, Mich.

Filed Apr. 21, 1975, Ser. No. 570,168
Int. Cl.² B41J *7/00*
U.S. Cl. 197—27 **2 Claims**



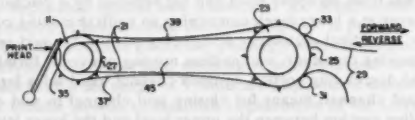
1. A type bar actuating mechanism for a typewriter of the class having a base, a keyboard with plunger-type keys, a plurality of type bar levers actuatable by means of cords, and a stem extending downwardly toward the base from each key and movable downwardly toward the base by depressing the key, including guide means for each stem carried by the base, the stems being slidably interengaged with the guide means, and anchoring means carried by the base at a position farther from the type lever than is the guide means, characterized by a cord attached to each type bar lever and extending beneath but in rubbing contact with the bottom of one of the stems and extending therebeyond to the anchoring means and attached to the anchoring means, a wall upstanding from the base at a position between the guide means and the type lever and against and over which the cords are pulled by the stems when the stems are depressed by the keys, the guide means comprising a tubular boss extending upwardly from the base in alignment with each stem to a position higher than the cord and in which the stem is slidable, each boss having vertically slotted portions through which one of said cords extends and in which the cord is vertically movable.

4,000,803

VACUUM-BUFFERED BIDIRECTIONAL PAPER DRIVE SYSTEM

Rick A. Warp, San Diego; John L. Morton, Jr., Escondido, and Majid Azmoon, San Diego, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 21, 1976, Ser. No. 650,839
Int. Cl.² B65H *23/24;* **B65J** *15/00*
U.S. Cl. 197—133 R **12 Claims**



1. A web driving system comprising:

platen means having at least end portions which are rotatable about a common axis and which are disposed to receive a web to be driven with substantial wrap thereabout;

roller means disposed to rotate about an axis which is spaced from, and which is parallel to, and coplanar with, said common axis for receiving and delivering a web which is wrapped about the platen means and which contacts said roller means on substantially oppositely disposed portions of the circumference of said roller means;

drive means coupled to said end portions and to said roller means for selective rotation thereof at identical surface velocities;

a pair of boundary means laterally disposed adjacent opposite ends of the roller means and said end portions to traverse the spacing therebetween for forming boundaries of a chamber; and

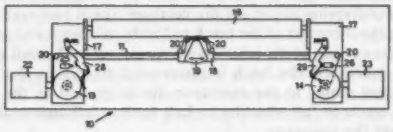
means cooperating with the chamber formed by said pair of boundary means, said platen means, and said roller means and by a web being driven thereby, for producing a fluid pressure differential within said chamber relative to ambient fluid pressure for maintaining tension in said web about said platen means and between said platen means and roller means.

4,000,804

ARRANGEMENT FOR TRANSFERRING A RIBBON FROM A FEED SPOOL TO A TAKE-UP SPOOL

Adriano Zaltieri, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Feb. 6, 1976, Ser. No. 655,645
Claims priority, application Italy, Feb. 10, 1975, 67342/75
Int. Cl.² B41J *33/34, 33/512;* **H02P** *7/68*
U.S. Cl. 197—151 **15 Claims**



1. An arrangement for transferring a ribbon from a feed spool to a take-up spool comprising a first and a second direct current electric motors connected to said feed spool and to said take-up spool, respectively, for effecting the rotation thereof, and means for both causing one of the two motors to wind-up said ribbon with a minimum torque and said ribbon to be kept taut during the transferring thereof, said means comprising a constant voltage generator supplying the other of the two motors and a constant current generator supplying said one motor.

4,000,805

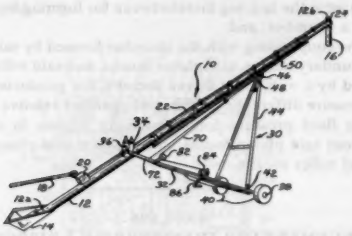
SAFETY STOP FOR PORTABLE AUGERS AND LIKE ELEVATING MACHINERY

Howard Hadler, Kewanee, Ill., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed June 6, 1975, Ser. No. 584,505
Int. Cl.² B65G *41/00*
U.S. Cl. 198—320 **11 Claims**

1. In portable crop and materials handling machinery, an inclinable conveyor having a feed end and a discharge end, a track along the underside of the conveyor between said feed and discharge ends having abutments and intervening spaces along the length thereof, a mobile triangular support for said inclinable conveyor having first and second relatively long frames hinged together adjacent their lower ends, the upper end of the first frame being connected to the inclinable conveyor near its feed end and the upper end of the second frame being connected to a carriage movable along said track be-

tween the conveyor discharge end and said connected end of the first frame to vary the separation of the upper ends of the two frames and thereby the altitude of the discharge end of the inclinable conveyor, cable means connected between the carriage and the upper end of the first frame, and a winch carried by one frame on which the cable means is wound and unwound against the resisting weight of the inclinable conveyor tending to separate the two frames so as to maintain pulling tension between the two frames and thereby maintain the altitude of the conveyor discharge end, said machinery including normally inactive latent means in combination therewith which upon failure or sudden loss of tension of the cable means between the frames is automatically activated to stop descent of the conveyor discharge end and total collapse of the conveyor, said latent means comprising a latch rotatably connected intermediate its ends to the carriage, the end of the latch toward the conveyor discharge end being movable on said rotatable connection into said intervening spaces between the abutments of the track, means on the latch to the opposite side of its rotatable connection to the carriage against which the pull of the cable means is continuously directed in the normal elevating and lowering of the conveyor to hold said latch end out of said intervening spaces of the track, and spring means on the carriage which bias said latch end in the direction of the track to locate said latch end within an adjacent one of the intervening spaces when the pull of the cable means on the latch is interrupted to engage the next abutment closer to the conveyor discharge end as the conveyor starts to fall whereby to halt further fall and total collapse of the conveyor.



4,000,806

APPARATUS FOR DESTACKING A SUBSTANTIALLY SPIRAL-SHAPED FORMED STACK OF PRINTED PRODUCTS

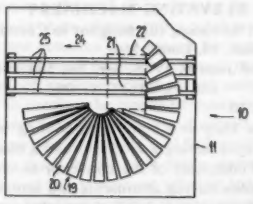
Felix Dietrich, Uster, and Werner Honegger, Ruti, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed May 16, 1975, Ser. No. 578,040

Claims priority, application Switzerland, May 28, 1974, 7236/74

Int. Cl.² B65G *59/00*

U.S. Cl. 198—443 **9 Claims**



1. An apparatus for destacking a stack of printed products in a substantially spiral-shaped configuration comprising successive contiguous coils of printed products, each coil having neighboring printed products partially overlapping one another, comprising stack support means including support surface means located substantially in a single plane for receiving the spiral-shaped configuration of printed products, said stack support means being provided with a stationary throughpassage opening, rotational drive means for placing into rotation the spiral-shaped configuration of printed products which are supported upon the stack support means about the lengthwise axis of the spiral and for successively feeding the coils from the stack beginning with the lowermost coil from the bottom end of the stack through the stationary throughpassage opening, and outfeed conveyor means arranged subsequently of said stationary throughpassage opening.

4,000,807

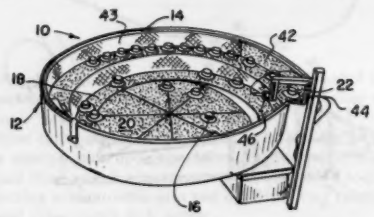
VIBRATORY TROUGH PART FEEDER

Robert S. Molique, Dayton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed May 21, 1975, Ser. No. 579,747

Int. Cl.² B65G *27/00*

U.S. Cl. 198—443 **6 Claims**



1. In a vibratory bowl feeder of the type having a bowl and a spiral trough extending about the periphery of said bowl receiving parts contained in said bowl at a central location and feeding the same to an outlet point, the improvement comprising:

an inclined fiber material disposed along the bottom of said spiral trough with said inclined fiber material oriented with said fibers inclined in the direction of said spiral trough for at least a portion of said spiral trough and wherein said inclined fiber material disposed in said spiral trough includes a segment in a portion of said trough approaching said outlet wherein said segment fibers are inclined towards a wall of said spiral trough to thereby reduce the rate of movement of said parts on said segment, and wherein said inclined fiber material disposed in said spiral trough in a region following said segment and proximate said outlet is disposed with said fibers inclined along the direction of said spiral trough, whereby said parts are separated proximate said outlet by the resulting differing rates of movement of said parts.

4,000,808

DEVICE FOR LOWERING BULK MATERIALS

Jacques Pradon, 19 Avenue des Tourelles, Saint-Maur-des-Fosses, France

Continuation-in-part of Ser. No. 474,080, May 28, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,320

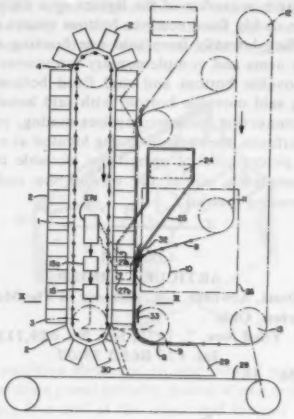
Claims priority, application France, June 6, 1973, 73.20561

Int. Cl.² B65G *43/08*

U.S. Cl. 198—572 **9 Claims**

1. A device for continuously lowering a supply of bulk material from an upper level and for removal by a discharge conveyor at a lower level, comprising an endless moving conveyor, a vertical rectilinear descending portion for said endless moving conveyor, said endless moving conveyor forming in said descending portion an open channel, rigid sides forming said channel, means for closing said channel in said descending portion between the upper level and the lower level, said means defining with said endless moving conveyor be-

tween the two levels a closed chimney having rigid descending walls, means for regulating the speed of movement of said endless moving conveyor as a function of the height of material in said chimney to maintain an upper level of material in said chimney at a constant level when said discharge conveyor



receives material from said chimney and means for regulating the speed of movement of said discharge conveyor at a constant ratio to that of said endless moving conveyor whereby the flow from said discharge conveyor is equal to the flow from said endless moving conveyor when said chimney is filled with material.

4,000,809

TUBULAR BELT CONVEYOR

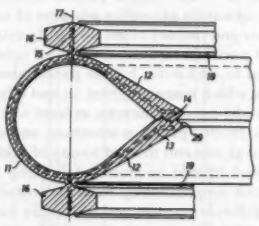
Bo Nils Konrad Lenntoft, Loddekopinge, Sweden, assignor to Sintab Swedinventor AB, Malmo, Sweden

Filed Dec. 10, 1974, Ser. No. 531,672

Claims priority, application Sweden, Dec. 11, 1973, 7316679

Int. Cl.² B65G *15/08*

U.S. Cl. 198—819 **8 Claims**



1. A tubular belt conveyor comprising a plurality of pulleys, an endless conveyor belt running over the pulleys and which is formed to a tubular profile and the longitudinal edges of which converge substantially rectilinearly to one another on the inner run of the endless loop formed by the conveyor belt and are applicable against one another at the longitudinal conveyor belt edges, wherein the conveyor belt is provided with spring clip means to elastically yieldingly load the longitudinal conveyor belt edges into abutting relationship and in which beads having the shape of V-belts are disposed on the sides of the tubular profile to establish engagement of the conveyor belt with the pulleys.

4,000,810

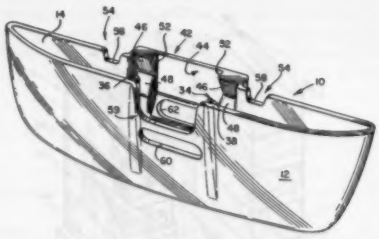
CASE FOR CLIP-ON SUNGLASSES

Conrad L. Leblanc, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Oct. 3, 1975, Ser. No. 619,430

Int. Cl.² A45C *11/04*

U.S. Cl. 206—5 **7 Claims**



1. A molded rigid plastic case for clip-on sunglasses, said sunglasses including a pair of lenses with front and rear viewing surfaces and a centrally located clip means supporting said lenses for attachment to an optical eyeglass frame, said case comprising:

a substantially pouch shaped one-piece open topped rigid plastic container body for receiving and protectively enclosing the lenses and clip means of the clip-on sunglasses, said body having joined front and rear rigid plastic contoured wall portions such that no portion thereof contacts either the front or rear viewing surfaces of said lenses when said clip-on sunglasses are properly contained in said body;

opposed clip means engaging portions centrally located and inwardly facing on said front and rear wall portions of said body including rib means extending inwardly toward the interior of the case from one of said front and rear wall portions and opposing said rib means on the other of said wall portions, a recess for receiving and engaging a portion of the clip structure, said rib means and recess being spaced apart a distance such as to frictionally hold said clip structure firmly therebetween and serving as a combined means for positively preventing the contact of the front and rear viewing surfaces of the lenses with said front and rear rigid plastic wall portions of said body and to prevent the inadvertent slippage of said clip-on sunglasses from their properly held position in said case.

4,000,811

SHIPPING-DISPLAY CONTAINER

Jerry C. Hardison, Dallas, and Laverne E. Gray, Irving, both of Tex., assignors to Lone Star Container Sales Corporation, Dallas, Tex.

Filed Mar. 12, 1975, Ser. No. 557,528

Int. Cl.² B65D *5/54*, *5/48*

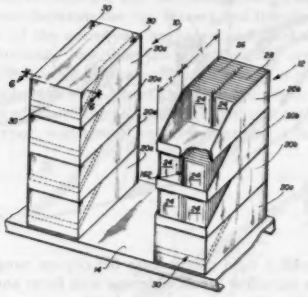
U.S. Cl. 206—44 R **25 Claims**

11. A device for use in shipping, display and dispensing of a plurality of articles, said device comprising:

front, rear and two side walls of sheet material, flaps extending from said front, rear and side walls forming top and bottom walls, said top, bottom, front, rear, and side walls forming a shipping container for shipping said articles; and

tear strip means formed in said container for removing the top wall, and a portion of the front and of each of the side walls, whereby a portion of said shipping container may be removed to convert said container into a display tray having front, rear, bottom and side walls and wherein said articles are visual and can be removed when said tray is positioned with said bottom wall facing downward and said rear wall facing away from the viewing position, said tear strip means formed by spaced weakened tear lines

formed in each of said side wall top flaps, each of said side walls and said front wall, one of said tear lines in each of said side walls top flaps extending along at least a portion of the line between said side wall and said side wall top flap, the other of said tear lines in each side wall top flaps being spaced from said one tear line in said side wall top flap, said two spaced tear lines in each of said side walls



extending from the line separating said side wall and said side wall top flap to the line separating said side wall and said front wall, each of said tear lines in said side walls intersecting one of said tear lines in said side wall top flap, and said two spaced tear lines in said front wall extending between the lines separating said side walls and said front wall, each of said tear lines in said front wall intersecting one of said tear lines in each of said side walls.

4,000,812

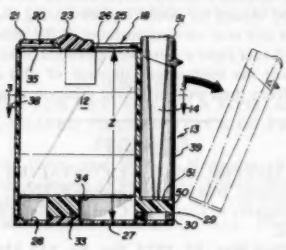
CADDY FOR CIGARETTES AND THE LIKE

Arthur J. Pisarski, and Margaret Pisarski, both of c/o MACH II, Oak and Astor Sts., Monee, Ill. 60449

Filed Aug. 20, 1975, Ser. No. 606,169

Int. Cl.² A24F *15/10*

U.S. Cl. 206—87 **7 Claims**



1. A caddy for carrying a package of cigarettes or the like having a predetermined outer size and shape and a cigarette lighter of predetermined outer size and shape, comprising, in combination, an enclosed cigarette package housing having an inner cross sectional area of relatively large length and relatively small width adapted to snugly accommodate the corresponding cross sectional area of a cigarette package, and having a depth sufficient to accommodate the corresponding depth of a cigarette package of extended length, a housing top formed with a hole shaped and located to be superimposed over a standard cigarette package hole, a movable cover carried by the caddy for covering and uncovering the housing top hole, an actuator surface on the cover oriented and adapted for engagement and cover actuation by a digit of a hand holding the caddy, a movable bottom carried by the housing for covering and uncovering the housing bottom to permit a cigarette package to be inserted into or withdrawn from the caddy, a pincer retainer integral with and located at one of the two opposed small housing sides, the retainer including at least two spaced apart resilient pincer arms extending toward one another and having inner surfaces for accommodating and resiliently retaining a cigarette lighter of predetermined shape and size on and in the caddy in a position to permit ignitive operation of the lighter by a digit of the hand holding the caddy fixed retainer bottom means integral with and extending laterally from said one housing side beneath said pincer arms and complementary interconnecting means on said movable bottom and said fixed bottom means for connecting said movable bottom with said housing, wherein said interconnecting means comprises mating, pivotable, detachable surfaces, the surfaces being located at a point below the caddy pincer arms to permit the movable bottom to be pivoted completely out of the way of the caddy cigarette package housing interior.

4,000,813

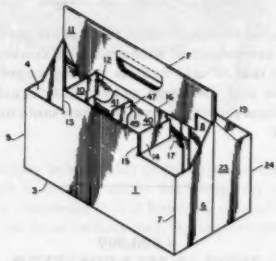
ARTICLE CARRIER

James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 7, 1975, Ser. No. 629,711

Int. Cl.² B65D *75/00*

U.S. Cl. 206—187 **8 Claims**



1. An article carrier comprising a bottom panel, side walls foldably joined to the side edges of said bottom panel, end wall panels foldably joined to the end edges of said side walls, riser panels foldably joined to said end wall panels at one end of the carrier and extending medially inward of the carrier, medial partition structure foldably joined to the end wall panels at the other end of the carrier and extending medially inward of the carrier, a pair of outer handle panels secured at one end thereof to the upwardly extending portions of said riser panels and at the other end thereof to the upwardly extending portion of said medial partition structure, a pair of reinforcing panels foldably joined to said outer handle panels along at least one offset fold line which is spaced from an end edge of said outer handle panels and parallel thereto, at least one anchoring tab secured to said medial partition structure, and a partition strip foldably joined at one end thereof to one of said side walls and at the other end to said anchoring tab along a tab fold line which is spaced longitudinally from the offset fold line between said reinforcing panels and said outer handle panels by a distance which is less than the length of said partition strip.

4,000,814

ARTICLE CARRIER

James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio

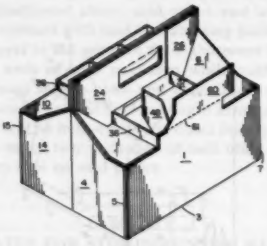
Filed Nov. 17, 1975, Ser. No. 632,362

Int. Cl.² B65D *75/54, 85/00*

U.S. Cl. 206—187 **3 Claims**

1. An article carrier comprising a bottom wall, side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, a multiple ply handle compris-

ing at least one pair of handle panels, medial partition structure including a pair of medial panels foldably joined respectively to said end wall panels at one end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, riser panels foldably joined respectively to said end wall panels at the other end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, an anchoring flap secured to one of said side walls, an anchoring tab secured to



said medial partition structure on one side of said handle, a transverse partition panel foldably joined at one end thereof to said anchoring flap and at the other end thereof to said anchoring tab, a twist interconnecting said anchoring tab and one of said handle panels, a promotional tab foldably joined to the top edge of the other of said side walls, and said side walls respectively comprising high center portions, said promotional tab being foldably joined to the high center portion of said other side wall.

4,000,815

DEVICE FOR STORAGE AND TRANSPORT OF TEMPERATURE SENSITIVE GOODS

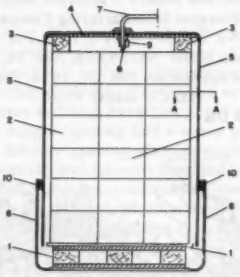
Torgny Wingbro, Hisingsbacka; Jan Hjalmarsson, Molndal, and Per August Pettersson, Sodertalje, all of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Jan. 28, 1976, Ser. No. 653,124

Claims priority, application Sweden, Jan. 28, 1975, 7500863

Int. Cl.² B65D *81/24*

U.S. Cl. 206—205 **8 Claims**



1. Apparatus for storage and transport of temperature sensitive goods, comprising a load carrier pallet for supporting the goods, an upper insulating cover for covering the goods and the upper edge of said pallet, means in said upper cover for supplying a gaseous cooling medium to the interior thereof to control the temperature therein, a lower cover enclosing said pallet and the lower part of said upper cover, means fastening said lower cover to said upper cover, and a sealing member between the facing surfaces of said upper and lower covers, whereby a blocking gas layer of cooling medium is maintainable around the goods.

4,000,816

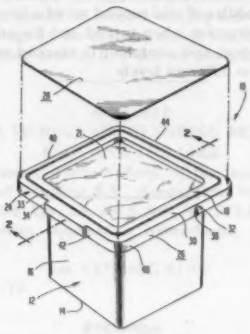
MOISTURE IMPERVIOUS PACKAGING SYSTEMS

Harry Spruyt, New York, N.Y., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Mar. 4, 1976, Ser. No. 663,910

Int. Cl.² B65D *5/54*

U.S. Cl. 206—498 **11 Claims**



1. A moisture impervious packaging system comprising:

A. a container body having a bottom wall and peripheral walls extending upwardly from the bottom wall and terminating in an upper surface which defines an access opening into an interior compartment of the body; and

B. a closure lid hingedly connected to said container body and including a peripheral frame member and a flexible, moisture impervious sheet, said peripheral frame member disposed exteriorly of the container body and circumscribing the access opening into the interior compartment thereof for providing side margins of said closure lid, said moisture impervious sheet being disposed over the access opening into the container body and being adhered to the upper surface of the container body to provide a moisture impervious seal over the access opening into said body, and being adhered to said frame member to provide a top wall of the closure lid.

4,000,817

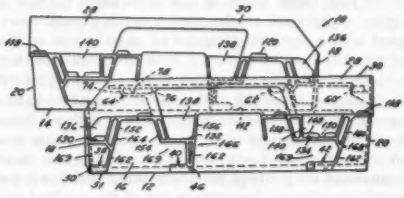
THREE LEVEL STACKING CONTAINER

Ellsworth E. Sanders, Sanibel Island, Fla., and Elsmer W. Kreeger, Pontiac, Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed May 8, 1974, Ser. No. 467,851

Int. Cl.² B65D *21/04*; A47F *1/14*

U.S. Cl. 206—505 **20 Claims**



1. A stacking container comprising a generally rectangular bottom wall, first and second side walls extending upwardly in diverging relation from opposite sides of said bottom wall, stacking means for supporting said container in stacking relation upon a lower container of identical construction at at least two different levels, said stacking means comprises spaced feet on each side wall, said stacking means also comprising a first set of spaced saddles on each side wall and a

second set of spaced saddles on each side wall at a different level than the first set of saddles, the spacing of the saddles of the first set on said first and second side walls corresponding respectively to the spacing of the feet on said second and first side walls, the spacing of the saddles of the second set on said first and second side walls corresponding respectively to the spacing of the feet on the second and first side walls, whereby said feet are adapted to rest upon the saddles of said first set or upon the saddles of said second set of a lower container of identical construction when turned end for end with respect thereto to support said container in stacked relation thereon at either of two different levels.

4,000,818

ARRANGEMENT PERMITTING OF A STORAGE AND REMOVAL OF PROFILED MEMBERS

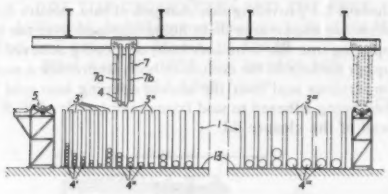
Peter-Jens Schmid, and Viktor Lattmanig, both of Vienna, Austria, assignors to Peter-Jens Schmid, Vienna, Austria

Filed Mar. 13, 1975, Ser. No. 557,937

Claims priority, application Austria, Mar. 13, 1974, 2112/74; Mar. 13, 1974, 2111/74

Int. Cl.² B65G *59/04*

U.S. Cl. 214—1 P **3 Claims**



1. An arrangement permitting of a storage and removal of profiled members, comprising a multiplicity of blocks provided with means for storing said members in vertical rows, each of said blocks being provided with means which form vertical comb tooth spaces, said blocks comprising a base and uprights which protrude upwardly from said base and which are aligned to form at least two spaced apart rows, in which each of said comb tooth spaces is defined by two of said uprights, each comb tooth space in each of said rows being aligned with a comb tooth space of another row so that profiled members can be stored in both said comb tooth spaces, the width of said aligned comb tooth spaces being substantially as large as the width of the profiled members to be stored therein so that the same are constrained to follow a linear path in each row of aligned comb tooth spaces, release means in each of said comb tooth spaces to prevent the downward movement of the profiled members along said linear path and operable to release a lowermost one of the profiled members while retaining succeeding profiled members, exit means disposed under each comb tooth space in line with said linear path and including driven rollers which are rotatable about an axis which is transverse to the longitudinal direction of said members for carrying off members in their longitudinal direction upon release thereof by said release means, and brushes protruding from the sides of said uprights into the comb tooth spaces to brake the profiled members as they fall along said linear path.

4,000,819

CONTROL ARM FOR A POWER MANIPULATOR

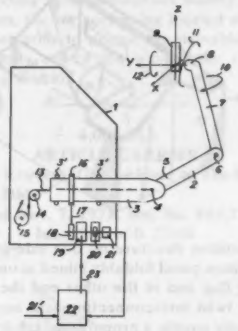
Jean-Claude Germond, Paris; Théodore Le Mouee, Nantes; Paul Marchal, Gif-sur-Yvette; Michel Petit, La Celle St-Cloud, and Jean Vertut, Issy-les-Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 20, 1976, Ser. No. 650,657

Claims priority, application France, Jan. 20, 1975, 75.01692

Int. Cl.² B25J *3/04*

U.S. Cl. 214—1 CM **9 Claims**



1. A control arm for a remotely operated power manipulator, comprising an assembly for carrying out a number of movements and position detectors for each movement, wherein the number of possible movements of the control arm is equal to the number of possible movements of the manipulator, wherein the motion-control operations can be interrupted at will and wherein at least one of the portions of the arm is provided with means for interlocking said portion with respect to another portion of the arm independently of the other movements as each position of the manipulator and of the arm are brought into complete concordance, said means for interlocking being releasable when complete concordance is obtained.

4,000,820

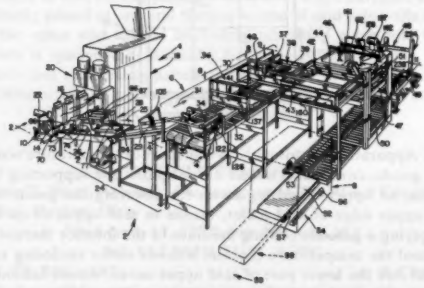
METHOD AND APPARATUS FOR ASSEMBLING LAYERS OF PACKAGES ON A PALLET

Kenneth G. Kurk, and Robert S. Kilbride, both of Quincy, Ill., assignors to Moorman Manufacturing Company, Quincy, Ill.

Division of Ser. No. 249,419, May 1, 1972, Pat. No. 3,827,577, which is a division of Ser. No. 89,658, Nov. 16, 1970, Pat. No. 3,700,127. This application Jan. 21, 1974, Ser. No. 434,807

Int. Cl.² B65G *57/10*

U.S. Cl. 214—6 DK **2 Claims**



1. In an automatic palletizer for assembling layers of elongated packages on a pallet with each package in each layer arranged in a predetermined pattern, said palletizer being of

the type which includes a shuttle plate on which said layers are formed, means for moving said shuttle plate over a pallet and means for wiping said layer off of said shuttle plate to deposit said layer over said pallet as said shuttle plate is retracted, each layer on said shuttle plate including two packages arranged end to end in abutting relationship and a plurality of other packages arranged side by side, the longitudinal extent of said two packages abutting each other end to end being less than the lateral extent of said other packages arranged side by side, the improvement comprising separating means for separating said two abutting packages, said separating means being operatively positioned above said pallet and arranged to be lowered into contact with said two abutting packages forming part of one layer at the point of their abutment for separating the abutting ends of said packages while said one layer is wiped off of said shuttle plate and deposited over said pallet whereby the outer ends of said packages arranged end to end on said pallet will be in line with the outer facing sides, respectively, of the outer two packages of said other packages arranged side by side on said pallet.

4,000,821

APPARATUS FOR STORING UNSTACKING AND DELIVERING ARTICLES

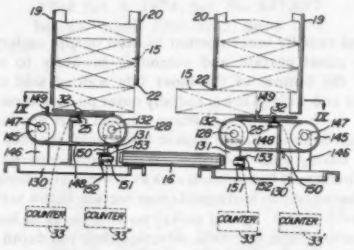
Han-Ichiro Naito; Tsuneo Yamaguchi, both of Tokyo, and Kiyoshi Harashima, Ome, all of Japan, assignors to Elecompack Company Ltd., Tokyo, Japan

Continuation of Ser. No. 258,179, May 31, 1972, abandoned. This application July 11, 1975, Ser. No. 595,164

Claims priority, application Japan, June 3, 1971, 46-38936; Oct. 1, 1971, 46-77002

Int. Cl.² B65G *59/00, 47/00*

U.S. Cl. 214—8.5 F **2 Claims**



1. An apparatus for storing and delivering articles, said apparatus comprising (1) storage means divided longitudinally into a plurality of storage compartments each adapted for accommodating a plurality of articles in substantially vertically stacked array and each having an upper portion provided with an article supply opening and a lower portion provided with an article delivery opening wherethrough articles may be delivered sequentially and laterally from the lowermost one of a stack of articles; (2) delivery means provided at each article delivery opening for delivering one article therethrough at a time, said delivering means including (i) a flexible and movable-in-place endless member in the form of an extended, generally horizontally disposed loop, said loop having one end and another end and arranged such that at least one end thereof is located below the storage compartment with which the particular article delivery opening is associated, and (ii) a plurality of extruding members in peripherally spaced relation on the outer surface of said endless member for successively extruding articles through said delivery opening as said endless member is moved; (3) a rotatably shaft member extending longitudinally of said storage means and disposed to have a driving means connected to it whereby it may be rotated; (4) clutch means on said shaft associated with each of said delivery means whereby said rotatable shaft may be engaged with said delivery means to drive all as well as a plurality of or any single one of the endless members thereof selectively; (5)switching means associated with each of said clutch means for controlling the operation thereof disposed to be engaged by said extruding members successively for the delivery means at each article delivery opening; and (6) conveyor means extending longitudinally of said storage means and having one edge and another edge with said edge located below the delivery openings of said storage compartments, said conveyor means being disposed to receive articles delivered from said delivery openings by the delivery means associated therewith and convey those articles to a desired position.

4,000,822

RECLAIMER TO RECLAIM BLENDING BEDS, STORAGE BEDS AND THE LIKE

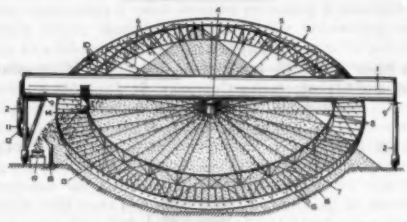
Johann A. Raabe, Badhoevedorp, Netherlands, assignor to International Handling B.V., Amsterdam, Netherlands

Filed Apr. 23, 1975, Ser. No. 570,643

Claims priority, application Netherlands, May 2, 1974, 7405913

Int. Cl.² B65G *61/00*

U.S. Cl. 214—10 **14 Claims**



1. An apparatus for reclaiming blending beds, storage beds and the like, comprising a movable bridge and unitary means for reclaiming material from a bed and discharging the reclaimed material to one side of the bridge, wherein the unitary means consists of a rotatable disc mounted to the bridge and having an axis of rotation the horizontal projection of which is substantially parallel to the direction of movement of the bridge, said rotatable disc being provided with teeth arranged in a pattern and protruding from the plane of the disc for loosening material from a face of the bed, and with an outer ring which projects from the plane of the disc so as to form a surface for collecting the loosened material and moving said material side-ways to one side of the bridge.

4,000,823

COMPACT CRANE

Joseph Aquila, 144-41 231 St., Rosedale, N.Y. 11422

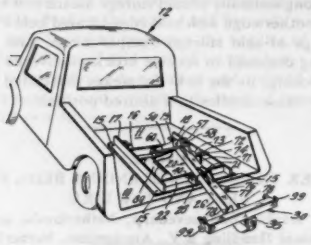
Filed Jan. 31, 1975, Ser. No. 545,930

Int. Cl.² B60D *3/12*

U.S. Cl. 214—86 A **3 Claims**

1. A crane including an elongated boom means; main pivot means supporting said boom means at a point intermediate its front and rear ends; tow bar means mounted to the boom means at said rear end; power operating means connected to said boom means at said front end for moving said front end downward and frontward in a working stroke to raise said tow bar means and a load connected thereto; said power operating means including a fluid operated power device having an extendable operating arm which is retracted in said working stroke; a base having said main pivot means at the rear thereof and said power operating means at the front of said base; said boom means including a front section and a rear section connected to said front section in the vicinity of said main pivot means; said rear section being pivotably movable with respect to said front section between an operating position wherein said tow bar means is below and rearward of said main pivot

means and a storage position wherein said tow bar means is positioned in front of and above said main pivot means; quick release retaining means to hold said rear section in said retracted position; a safety means pivotally mounted to said rear



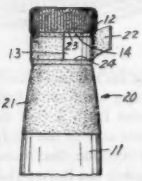
of said base and, when in a holding position, operatively engageable with said front section of said boom means to limit lowering of said tow bar means when a load is connected thereto.

4,000,824

TAPE CLOSURES

Hak Rhim Han, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 24, 1975, Ser. No. 598,820
Int. Cl.² B65D *41/24*
U.S. Cl. 215—232 **6 Claims**



1. In a secondary closure of the type in which a pressure-sensitive adhesive-coated heat-shrunken polymeric film is wrapped around and snugly conformed to the peripheral contours of a primarily sealed container, along and immediately adjoining both sides of the line of primary closure, a tear strip interposed between the film and the container so as to abut or overlie the line of closure, removal of said tear strip serving to rupture the film when it is desired to open the closed container,

the improvement which comprises the film being predominantly longitudinally oriented and formed from a copolymer selected from a class consisting of semi-rigid acrylonitrile:methylacrylate copolymer and semi-rigid styrene:butadiene copolymer,

whereby the tape seal presents a smooth, uniform appearance and removal of the tear strip tears the film along two substantially straight parallel lines, enhancing the appearance of the container in both closed and opened condition.

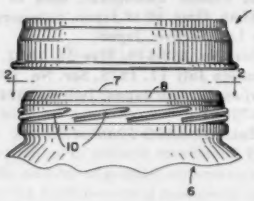
4,000,825

PRESS-ON TWIST-OFF INFESTATION-PROOF CLOSURE FOR OXYGEN SENSITIVE PRODUCTS

James E. Westfall, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 22, 1974, Ser. No. 472,137
Int. Cl.² B65D *41/04*
U.S. Cl. 215—318 **1 Claim**

1. In a press-on turn-off gasket closure cap of the combination top and side seal type for use in establishing and maintaining a hermetic seal on a glass container of the type in which the upper edge of the rim together with a frusto-conical portion of the side surface thereof provide the hermetic sealing finish and the outer surface of the container neck below said frusto-conical finish has a series of thread formations arranged in a circumferential band therearound, said cap comprising (1) a generally cup-shaped integral shell having a top panel portion having an annular margin which provides a gasketed down-turned channel formation registrable with said upper edge finish and having a stepped skirt portion with the upper inner step thereof being gasketed and depending from the outer wall of said channel formation as a continuation thereof and providing a downwardly and outwardly flared frusto-conical skirt portion embracingly registrable with said frusto-conical finish portion and having an inclination steeper than that of said frusto-conical finish portion and the bottom of which frusto-conical skirt portion joins an outwardly flared shoulder portion the bottom outer periphery of which joins the top of a lower outer cylindrical step terminating at the bottom in a bead, and (2) an upper annular sealing gasket formed of a solid plastisol located generally within the circumferential corner portion of said shell formed by said annular margin and said upper inner step of said stepped skirt portion having its



upper and radially inner portion located on the underside of said top panel portion and extending inwardly to at least adjacent the bottom of the inner side wall of said channel formation and with its lower radially outer portion terminating adjacent the bottom of said frusto-conical skirt portion, with said upper annular sealing gasket filling said channel formation and having a downwardly and outwardly tapered gasket portion lining said frusto-conical skirt portion and diminishing radially outwardly in horizontal cross-section below said channel formation, said tapered gasket portion being at least several times longer in a vertical direction than the depth of said channel formation, said channel-filling upper gasket portion sealingly engaging said upper edge finish of a container when said closure cap is hermetically sealed thereon with at least the lower part of said tapered gasket portion being appreciably thinned out by compressed sealing engagement between said frusto-conical finish portion and said frusto-conical skirt portion, the improvement in said closure cap, comprising, a lower generally cylindrical gasket formed of a puffed plastisol capable of taking a cold flow set lining said lower outer cylindrical step and compressingly embracing said series of thread formations of said container neck after being pushed downwardly thereover so as to take a set with respect thereto whereby said closure cap may be removed by rotation with respect to said container.

4,000,826

CRYOGENIC TRANSPORT

Thelmer A. Rogers, P.O. Drawer 1589, Lubbock, Tex. 79408

Filed Oct. 17, 1975, Ser. No. 623,378
Int. Cl.² F17C *1/12*
U.S. Cl. 220—3 **6 Claims**

1. An insulated tank for transporting cryogenic fluids comprising:

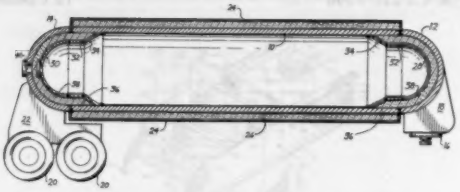
a. a cylindrical support and pressure shell with

b. a support head attached by structure and sealing weld at each end,

c. support structure on each head for mounting said tank for transportation,

d. an outer insulating shell over and spaced from the cylindrical support and pressure shell, and

e. an inner insulating head within and spaced from each support head,



f. the outer insulating shell sealed to the structural and pressure shell to provide an insulation space therebetween, and

g. each of the inner insulating heads sealed to the structural shell to provide insulation spaces between the structural and insulation heads.

4,000,827

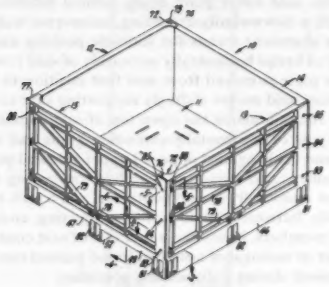
PRODUCE CONTAINER

Anthony Emery, 448 Scenic Ave., San Anselmo, Calif. 94960

Filed Jan. 9, 1976, Ser. No. 647,897

Int. Cl.² B65D *7/00, 9/12;* **B65J** *1/02*

U.S. Cl. 220—4 F **13 Claims**



1. A produce container comprising the combination of a rectangular planar base, means forming corner mortises on the corners of the base, four planar side panels mounted in upstanding relationship about the periphery of the base to define an upwardly open enclosure, means forming partial tenons projecting from opposite lower corners of each panel, with each partial tenon cooperating with a partial tenon of an adjacent panel to define a corner tenon which interengages with a respective corner mortise of the base, ledge means along the inner lower margin of each panel for supporting the side margins of the base, means forming a vertically elongate side mortise along one edge of each panel, means forming a vertically elongate side tenon along the opposite edge of each panel with the side tenon of each panel interfitting into the side mortise of an adjacent panel at a respective corner of the container, and fastener means for securing together the interfitting side tenons and mortises whereby the base is captured between the side panels.

4,000,828

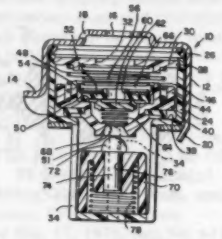
GAS TANK CAP WITH ROLL-OVER VALVING

Billy G. Crute, and John H. Evans, both of Connersville, Ind., assignors to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed June 2, 1975, Ser. No. 582,649

Int. Cl.² B65D *51/16*

U.S. Cl. 220—203 **7 Claims**



3. A cap for closing the filler neck of a vehicle fuel tank, said cap comprising a valve housing providing a passageway extending axially therethrough, means for connecting said housing to a filler neck, said housing being formed to provide an axially outer passageway portion, an axially inner passageway portion, and, intermediate said portions and in the center of said passageway, a valve opening, said housing also providing, about the periphery of said valve opening, an annular and axially outwardly facing first valve seat, said first valve seat having ports extending therethrough to provide communication between the axially outer passageway portion and the filler neck, said ports bypassing said valve opening, an annular first valve member, first spring means for yieldably urging said first valve member axially inwardly against said first valve seat normally to close said ports, pressure-vacuum valve means normally closing said valve opening and venting the tank when the pressure in the filler neck drops below a predetermined subatmospheric level and when the pressure in the filler neck exceeds a first predetermined superatmospheric level, said first spring means being calibrated to provide for movement of said first valve member axially outwardly away from said first valve seat when the pressure in the filler neck exceeds a second and greater superatmospheric level, said valve opening providing an axially inwardly facing second valve seat, and a second valve member disposed in said passageway to move axially outwardly into closing engagement with said second valve seat when said filler neck is tilted.

4,000,829

CONTAINER CLOSURE UNIT

Arthur L. Johnson, Jr., Rockford, and Marlow W. Dodge, Loves Park, both of Ill., assignors to Johnson Enterprises, Inc., Rockford, Ill.

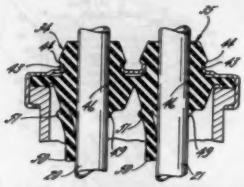
Filed Aug. 16, 1973, Ser. No. 388,982

Int. Cl.² B65D *41/20, 51/16*

U.S. Cl. 220—265 **1 Claim**

1. A unit for sealing a beverage container having an upwardly projecting neck defining an opening through which a beverage may be introduced into the container and into which the beverage and gas tubes of a tapping device may be inserted for purposes of dispensing the beverage from the container, said unit comprising an overcap having a circular top plate and having a peripheral skirt depending from said top plate, said skirt being of sufficient diameter to telescope over said neck and being sufficiently flexible to be crimped into engagement with the neck to establish a fluid-tight seal between the overcap and the container, first and second diametrically spaced holes formed through said top plate, first and second sealing plugs formed integrally with one another and each having an upper end portion telescoped snugly into and pro-

jecting upwardly from the respective hole, each of said plugs having a lower end portion extending below said top plate, an enlarged washer formed integrally with both of said plugs intermediate the ends of the plugs, said washer being disposed face-to-face with the underside of said top plate and being adapted to seat against the neck to help establish the seal between the container and the overcap, the lower plug portions below said washer being spaced from one another and being spaced inwardly from the wall of said opening, first and



second axially extending bores formed in said first and second plugs, respectively, and of sufficient diameter to permit insertion of the tubes into the container through the bores, membranes of resiliently yieldable material extending between the walls of said bores to seal off the latter and being sufficiently thin to be punctured by the tubes as an incident to insertion of the tubes through said bores, and first and second swingable flappers formed integrally with the lower end portions of said plugs and pivotally joined to the latter along first and second hinges disposed radially outwardly of the respective bores.

4,000,830

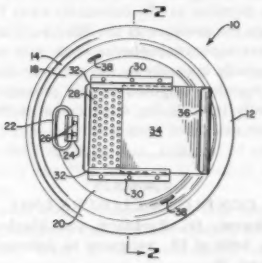
LID FOR A COOKING UTENSIL

Grace Allson French, 1744 17th St., Cuyahoga Falls, Ohio 44223

Filed Dec. 15, 1975, Ser. No. 640,628

Int. Cl.² B65D *51/16*

U.S. Cl. 220—369 **11 Claims**



1. A lid for a cooking container, comprising:

a substantially flat central section having a recessed rectangular plate suspended therefrom, the plate being characterized by a plurality of venting holes passing therethrough;

a way connected to the flat central section on each side of the recessed plate;

a first edge member connected to the central section in angled depending relationship about the periphery thereof;

a second edge member connected to the first edge member in angled ascending relationship about the periphery thereof; and

a lip connected about the circumference of the second edge member in substantial parallel planar relationship with the flat central section.

4,000,831

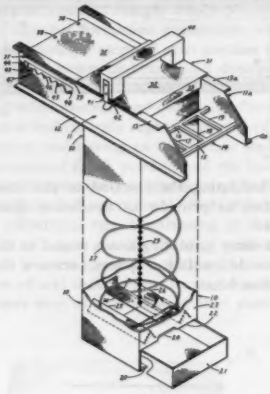
SLICED BREAD DISPENSER

Bruce F. House, Miami, Fla., assignor to Shelley Manufacturing Company, Miami, Fla.

Filed Dec. 11, 1975, Ser. No. 639,878

Int. Cl.² B65H *3/00*

U.S. Cl. 221—196 **12 Claims**



1. A sliced bread or sandwich dispenser comprising, in combination, a vertically-extending open top container for receiving stacked sliced bread for dispensing, a cover plate, means slidingly supporting said cover plate in spaced relation above the open top of said container for horizontally reciprocative forth-and-back movement, means limiting the extent of said cover plate movement between a backward-most first position of rest and forward-most second position of sliced bread dispensing, and means for resiliently constraining stacked sliced bread in said container in the upward direction so that the uppermost slice contacts the under-side of said cover plate, said cover plate being formed intermediate its length with a downwardly-extending, transverse wall portion serving as abutment means for slidingly pushing said uppermost slice of bread horizontally outwardly of said container as said cover plate is moved from said first position to said second position, said means slidingly supporting said cover plate in spaced relation above the open top of said container comprising a pair of horizontally-extending guide rail members secured, one each, against opposed upper sidewall portions of said container, said guide rail members projecting both forwardly and rearwardly of said container, and a rack extending horizontally between the forwardly-projecting ends of said guide rail members, below the upper end of said container, for the deposit or removal of a slice of bread pushed outwardly of said container during a dispensing operation.

4,000,832

DISPENSING CONTAINERS

Harry Pentney, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed Apr. 15, 1975, Ser. No. 568,297

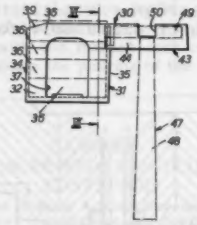
Claims priority, application United Kingdom, Apr. 19, 1974, 17365/74

Int. Cl.² B65D *83/10*

U.S. Cl. 221—232 **5 Claims**

1. A dispensing container for shaving units of the type comprising a blade and a member permanently secured thereto which provides a guard surface, the shaving unit being adapted for engagement with and disengagement from a razor handle, said container comprising a storage compartment for retaining a plurality of said shaving units, means for facilitating movement of shaving units retained in said storage compartment, said storage compartment being provided with an

opening through which said shaving units are movable successively, wall structure extending from said storage compartment and including an elongated front wall, an elongated rear wall and an end wall coupled to said front and rear walls at the outer extremities thereof, said front wall having a recess therein and means thereon for receiving and releasably retaining a head portion only of said razor handle, the remainder of said razor handle remaining outside of said container, and means facilitating longitudinal movement of said shaving unit through said opening and into engagement with said razor handle head portion, whereby one of said shaving units may be withdrawn from said container by withdrawal of said razor handle from said recess.

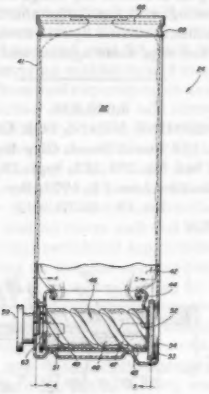


4,000,833

TONER DISPENSING APPARATUS

Robert G. Marks, East Walpole, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 6, 1975, Ser. No. 555,919
Int. Cl.² B65G *33/14*
U.S. Cl. 222—105 **16 Claims**



1. A toner dispensing apparatus for dispensing toner into the developer housing of an electrophotographic copier comprising:

A. toner dispensing means for dispensing toner into said developer housing; and,

B. toner supply means for maintaining a supply of toner to be dispensed by said toner dispenser means, said toner supply means including:

a. a container for holding toner, at least a portion of the walls of said container being flexible;

b. rotatable conveyor means for conveying toner from said container to said toner dispenser means; and,

c. means for deflecting said flexible wall portion for agitating the supply of toner maintained in said container, said deflecting means including:

1. tub means within which said rotatable conveyor means is supported, said tub means being normally rotatably with and by said conveyor means;

2. spring means for opposing the normal rotation of said tub means; and,

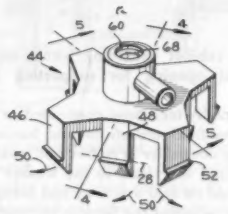
3. means for coupling said tub means to said conveyor means, said coupling means periodically releasing said tub means from said conveyor means whereby said tub means will be rapidly rotated by said spring means in the direction opposite that of said conveyor means to deflect said flexible wall portion.

4,000,834

APPARATUS FOR HEATING AND DISPENSING FLOWABLE MATERIAL

Edmond R. Whitley, Knoxville, Tenn., assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 17, 1975, Ser. No. 641,675
Int. Cl.² B65D *83/14*
U.S. Cl. 222—180 **6 Claims**



1. In an apparatus for electrically heating and dispensing flowable material from a pressurized container including a housing supporting the container, a heat exchanger connected thereto receiving material dispensed through a valve actuator assembly, and means effecting temperature control of said material, the improvement in the support and valve assembly means comprising,

said housing having spaced openings,

a claw-like member means supported in the housing with a first set of spaced projections depending through said housing opening fixedly locking said member therein,

a second set of spaced projections depending through said housing to lockingly engage and support a container means thereon,

a tubular passage in said member sealingly and fixedly receiving the container outlet through one end of the passage,

an actuator stem sealingly and spacedly disposed in the other end of the passage for movement against the container outlet to release and dispense material, and

a side passage in said member substantially between the stem and outlet and connected to said exchanger,

whereby said fixed member functions as the container support and valve actuator assembly for selectively dispensing controlled, heated, and measured material.

4,000,835

WINDSHIELD WASHER SERVICE APPARATUS

Walter D. Bassett, 5887 Shimer Ave., Indianapolis, Ind. 46219, and Terry J. Bassett, Rte. No. 3, Monticello, Ind. 47960

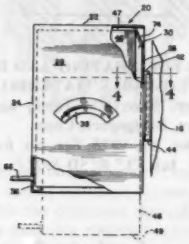
Filed Sept. 12, 1975, Ser. No. 612,642
Int. Cl.² B67D *5/60*
U.S. Cl. 222—183 **8 Claims**

1. Apparatus for dispensing automotive windshield wiper fluid, comprising

a cabinet in the form of a box-like structure having side and

top walls forming a weatherproof enclosure and having a bottom opening for insertion and removal from below of a liquid supply container, said cabinet mounted in elevated position at a service island adjacent a service station driveway at which washer-equipped automotive vehicles stop for other service, at a height such that liquid will readily flow by gravity to the washer equipment of such vehicles,

a replaceable multiple-charge supply container of wiper fluid removably mounted in said cabinet through said bottom opening,



means on the cabinet extending within the cabinet and adjacent said opening for supporting the container therein,

an elongated gravity-feed hose connected to said container for dispensing fluid therefrom and having a manually operable flow controller at its free end, said hose being of sufficient length to extend to the washer reservoir of a vehicle stopped on said driveway and being connected to the container adjacent the bottom thereof so as to move into and out of operative position with the container as the container is inserted and removed through said bottom opening.

4,000,836

PRESSURIZED DISPENSERS

Jillian A. Williams, Thorpe, and Ronald James, Hillingdon, both of England, assignors to Wilkinson Sword Limited, Great Britain

Continuation of Ser. No. 432,560, Jan. 11, 1974, abandoned. This application Aug. 12, 1975, Ser. No. 604,046

Claims priority, application United Kingdom, Aug. 8, 1973, 39151/73

Int. Cl.² B65D *83/14*; **C08K** *5/01, 5/05, 5/06*

U.S. Cl. 222—399 **10 Claims**

1. A pressurised dispenser comprising

a container provided with a valve-controlled outlet and containing a concentrate, and

a reservoir holding propellant, the reservoir comprising an extended rubber with which the propellant forms a solution and over which the vapour pressure of the dissolved propellant is less than that of the pure propellant, the rubber being extended by a substance having a low volatility and being compatible with but non-leachable by the propellant or the concentrate, the amount of extender present being at least 20% by weight but less than that which causes break up of the rubber,

the extended rubber being capable of forming a solution with at least 15% of its own weight of propellant at room temperature, and

the reservoir being capable of releasing propellant within the container as the contents of the container are dispensed.

4,000,837

SLIDING GATE VALVES

Ludwig Walther, Dueren-Niederau, Germany, assignor to United States Steel Corporation, Pittsburgh, Pa.

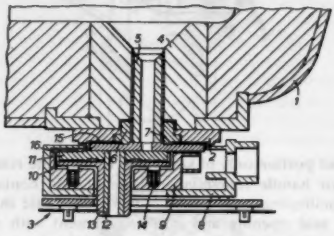
Filed Dec. 16, 1974, Ser. No. 532,976

Claims priority, application Germany, Dec. 21, 1973, 2363824; Dec. 21, 1973, 7345365[U]

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B22D *37/00, 41/08*

U.S. Cl. 222—512 **14 Claims**



1. In a sliding gate valve for a bottom pour vessel, wherein the valve comprises a replaceable ceramic head plate adapted for rigid, sealed mounting on the vessel, a slideable carriage and a replaceable ceramic slide plate borne thereon and carrying a pouring bushing, whereby said slide plate is movable in contact with said head plate to bring the bushing into and out of registry with the head plate aperture to open and close the valve, the improvement comprising:

first and second frames in which said head plate and said slide plate are respectively mounted,

cooperating sealing means on said bushing and said slide plate,

a collar having an extended top flange and forming a holder for said bushing, said top flange abutting the slide plate, and

spring elements carried by said carriage to engage said top flange and urge same against said slide plate.

4,000,838

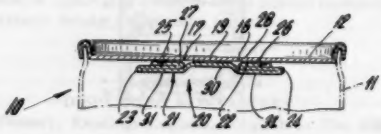
SPOUT FORMING MEANS FOR CONTAINERS

Clayton Bogert, 118 Lowell Road, Glen Rock, N.J. 07452

Continuation of Ser. No. 293,355, Sept. 29, 1972, abandoned. This application June 11, 1975, Ser. No. 585,932

Int. Cl.² B67D *5/12*

U.S. Cl. 222—529 **7 Claims**



1. Container having a substantially rigid lid secured to its walls,

weakened scoring lines formed in a portion of the lid and defining an opening area,

a tab opener disposed inwardly of the edge of the container and secured to the lid within the bounds of the scoring lines to form a lid opening when the tab opener is lifted, and

a substantially fan-folded flexible member disposed within the container and having corresponding lateral edges and a leading edge, and secured at its lateral edges to the underside of the lid outwardly adjacent to the bounds of the scoring lines and secured at its central portion to the

underside of the lid within the bounds of the scoring lines, and having substantially freely disposed fold portions between each of its lateral edges and the central portion, the fold portions being folded in substantially adjacent to the lid, and its leading edge being substantially crosswise between its lateral edges and along the corresponding fold portions thereat to define a spout rim portion,

whereby when the tab opener is lifted to provide the lid opening, the central portion, leading edge and fold portions of the fan-folded flexible member are outwardly drawn therewith and through such opening to form a spout to facilitate the pouring of the contents from the container.

4,000,839

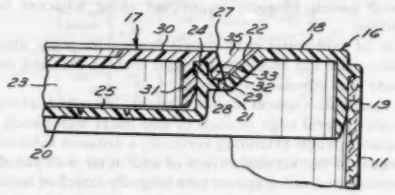
SAFETY CLOSURE WITH REMOVABLE LID FOR CONTAINERS

Charles Tecco, and William A. Loughley, both of c/o Weatherchem Corp., 2222 Highland Road, Twinsburg, Ohio 44087

Filed May 21, 1975, Ser. No. 579,468

Int. Cl.² B65D *47/12*

U.S. Cl. 222—540 **5 Claims**



1. In combination, a container and a child resistant molded plastic end closure, said container having an interior at least partially filled with a product to be dispensed, and said end closure being disposed on one end of said container, said end closure comprising a one-piece stationary cap and a one-piece removable lid; said cap and said lid each including detent means frictionally securing said lid to said cap and permitting removal of said lid from said cap only by an axial force exerted on said lid in a direction away from said interior of said container; said lid including a generally flat round lid cover wall and an annular lid peripheral wall extending axially from said cover wall and terminating at an annular free edge, the juncture of said lid peripheral wall and said annular free edge defining an annular peripheral bottom outside corner of said lid, the juncture of said lid cover wall and said lid peripheral wall defining an annular peripheral top outside corner of said lid; said cap including an annular cap peripheral wall, a cap dispensing wall having at least one opening for dispensing said product from said container, said cap dispensing wall being axially spaced from said cap peripheral wall into said interior of said container, a cap connecting wall extending axially from said cap peripheral wall to said cap dispensing wall, said cap connecting wall including an annular safety wall, and said cap connecting wall and said cap dispensing wall cooperatively defining an open ended cylindrical recess in said cap; said lid being received within said recess, said annular safety wall of said cap closely confronting said lid peripheral wall about its entire annular extent to limit access to said lid peripheral wall, said peripheral bottom outside corner of said lid engaging said annular safety wall of said cap about its entire annular extent to prevent access to said bottom outside corner of said lid and to said annular free edge of said lid; said annular peripheral wall of said lid and said annular safety wall of said cap cooperatively defining an open ended annular groove, said annular groove being dimensioned and arranged to prevent a finger of a child from entering said groove and contacting said lid peripheral wall means on said annular peripheral wall of said lid disposed in said groove for receiving an axial lifting force in a direction away from said interior of said container and said annular safety wall of said cap being conical and facing radially inwardly and axially away from said interior of said container.

4,000,840

TUNDISH CAR AND ROTARY SUPPORT FOR POSITIONING TUNDISH

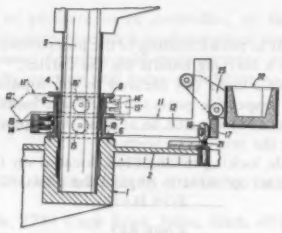
Alois Scheinecker, and Stefan Biricz, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Aug. 21, 1975, Ser. No. 606,564

Claims priority, application Austria, Aug. 30, 1974, 7026/74

Int. Cl.² B22D *41/12*

U.S. Cl. 222—607 **4 Claims**



1. In a continuous casting plant with at least one tundish car carrying a tundish at one end and movable on a generally horizontal circular arc-shaped pathway by means of rollers attached to the tundish car adjacent the tundish and supported on top of the pathway, the improvement comprising:

a generally vertical stationary column concentric with the pathway and rotatably supporting the tundish car, said column having at least two flanges extending radially from the exterior of the cylinder to form a guide path;

three guiding rollers attached to the tundish car and symmetrically arranged about the periphery of the column to run on the cylinder face between the flanges of the guide path so as to provide centering of the tundish car relative to the column; and

two supporting rollers attached to the tundish car and arranged to run in the guide path on at least one of the flanges in order to secure the tundish car against tilting.

4,000,841

MULTI-COMPARTMENT, MULTI-LEVEL STACKING CARRIER, PARTICULARLY FOR SMALL PARTS, TOOLS, AND THE LIKE

Emil Bachli, Hauptstrasse 156, CH 5304 Endingen, AG, Switzerland

Filed Apr. 29, 1975, Ser. No. 572,842

Claims priority, application Switzerland, Apr. 29, 1974, 6097/74; Apr. 24, 1975, 5381/75

Int. Cl.² A47G *23/06*

U.S. Cl. 224—48 R **11 Claims**

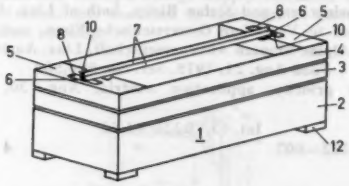
1. Multi-compartment, mutli-level stacking carrier comprising

a plurality of trays (2, 3, 4) of substantially similar outline stacked above each other;

elongated tension means (9) engaging the trays and secured to the top tray and holding the trays in relative spaced position when the carrier is erected;

at least two elongated tubular guide posts (7) located at opposite sides of the carrier and extending perpendicularly with respect to the trays, the guide posts, each including a folding knee joint (10) to permit articulation thereof in one direction and folding of the guide posts flat over the top-most tray (4) of the stacked trays (2, 3, 4),

the knee joint (10) on one of the posts being located at the height above the height of the trays, when the trays are stacked tightly above each other, to permit folding-over of the portion of the post above the respective joint to extend transversely across the topmost tray, the knee joint of the other post being located offset vertically with respect to the knee joint of said one post by the thickness



of the post to permit folding of the posts above each other and form a carrying handle for the carrier;

and respective locks (8) secured to the topmost tray (4) engaging respective posts (7) each said locks including guide means (24) secured to at least the topmost tray and engaging the respective posts;

and movable locking means (26), located on the topmost tray (4) and operable to engage the posts.

4,000,842

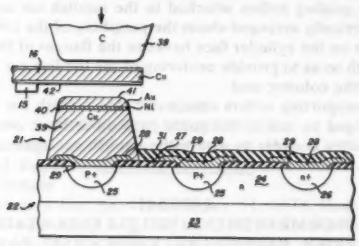
COPPER-TO-GOLD THERMAL COMPRESSION GANG BONDING OF INTERCONNECT LEADS TO SEMICONDUCTIVE DEVICES

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed June 2, 1975, Ser. No. 582,620

Int. Cl.² B23K *19/00;* **H01L** *21/603*

U.S. Cl. 228—180 A **14 Claims**



1. In a method for thermal compressing gang bonding of lead structures from a tape to a semiconductive device in an automatic gang bonding machine, such semiconductive device being of a type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to underlying patterns of metallization on the semiconductive device, and wherein at least one copper portion of a first structure operatively associated with the semiconductive device is to be thermal compression gang bonded to a gold portion of a second structure operatively associated with the semiconductive device, the steps of:

heating and pressing the copper portion of the first structure into thermal compression bonding relation with the gold portion of the second structure to produce a solid state interdiffusion between the copper and gold portions to obtain upon cooling thereof a final bonding interface between the copper and gold portions, such interface comprising a solid state interdiffusion of the copper and gold portions.

4,000,843

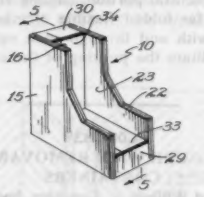
DIE CUT CORNER PAD

Wayne H. Sorensen, St. Paul; John F. Sorensen, Minneapolis, both of Minn., assignors to Hoerner; Waldorf Corporation, St. Paul, Minn.

Filed May 7, 1976, Ser. No. 684,276

Int. Cl.² B65D *85/30, 85/48*

U.S. Cl. 229—14 C **2 Claims**



1. A blank made of corrugated paperboard or similar sheet-like material and adapted to be erected into a right angle outside corner pad, said blank comprising:

a pair of rectangular outer wall panels having horizontal top and bottom edges and vertical lateral edges, said outer wall panels hingedly connected along adjacent lateral edges;

each of said outer wall panels having hingedly attached along the top and bottom edges thereof first and second side wall panels, respectively;

a rectangular spacer panel hingedly attached along the outer lateral edge of each of said outer wall panels, said spacer panels extending vertically a distance substantially equal to the vertical extent of said outer wall panels;

vertically extending spacer tabs hingedly attached to the top and bottom edges of each of said rectangular spacer panels;

a rectangular inner wall panel hingedly connected to the outside lateral edge of each of said rectangular spacer panels, the vertical extent of each of said inner wall panels being approximately equal to said outer wall panels; and

a rectangular locking flap hingedly attached to the outer lateral edge of each of said inner wall panels.

4,000,844

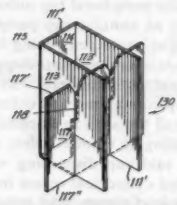
ONE-PIECE PARTITION

Charles Perry Weimer, Plainfield, Conn., assignor to International Paper Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,135

Int. Cl.² B65D *5/48*

U.S. Cl. 229—15 **28 Claims**



1. A blank for a one-piece partition, which comprises:

a panel having a set of two substantially rectangular flaps arranged in a row; said flaps of said panel being foldably connected along a fold line between said flaps;

a continuous slot being provided in the width-wise middle of an outer flap of said set of flaps of said panel, extending from one side of said set of flaps and parallel to said fold line;

a bridging member, one side of which is foldably connected only to an inner flap of said set of flaps along said one slotted side of said set of flaps; and

a forked panel, foldably connected to the opposite side of said bridging member, remote from said one slotted side of said set of flaps, and having a continuous slot extending from a side thereof remote from said one slotted side of said set of flaps;

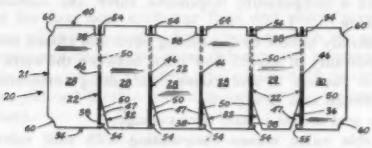
the center line of said slot in said forked panel being substantially colinear with said fold line between said inner and outer flaps of said set of flaps, and the length of said bridging member, between said forked panel and said inner flap, being about equal to the distance between the center line of said slot in said outer flap and the adjacent fold line between said inner and outer flaps in said set of flaps in said panel.

4,000,845

PARTITION ASSEMBLY AND PARTITION STRIPS THEREFOR

Allen D. Zeller, Merced, Calif., assignor to Clevepak Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,746
Int. Cl.² B65D *85/00*
U.S. Cl. 229—15 **5 Claims**



1. A partition strip for use in a partition assembly comprising means to interlock with cooperating cross partition strips, the interlocking means including a plurality of generally parallel slots in the partition strip, the slots dividing the partition strip into a plurality of sections, including a first section having a projection extending at an edge of said strip into a slot, a second section having a projection extending at said edge into another slot and facing opposite to said projection of the first section, the first and second sections being at opposite ends of the strip and said projections of said first and second sections facing each other, intermediate sections between said first and second sections, all but one of said intermediate sections having projections extending at said edge into other of said slots, the strip further including notches in the edge of the strip opposite said projections and in alignment with said slots for reception of projections of cross strips, whereby all of the sections of the partition strip except one intermediate section have projections, the projections of the outer end sections facing each other, for supporting engagement with notches of cross strips.

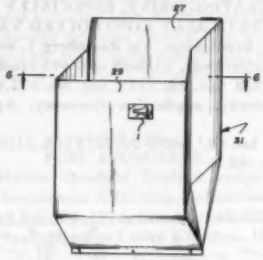
4,000,846

PRESSURE RELIEF VALVE AND BAG INCORPORATING SAME

Seymour Gilbert, Piscataway, N.J., assignor to Dunkin' Donuts Incorporated, Randolph, Mass.

Filed June 30, 1975, Ser. No. 591,508
Int. Cl.² B65D *31/14*
U.S. Cl. 229—62.5 **14 Claims**

1. A pressure relief valve for permitting the release of pressure from an enclosed area, without permitting substantial reverse flow into said enclosed area, which comprises a rigid base member including a raised portion, a flexible valve membrane stretched across the surface of said base member, said flexible valve membrane including a surface area of at least 500 times the maximum displacement of said flexible valve membrane at any point thereon which is required to obtain a flow through said valve, said flexible valve membrane further including slot means located in the portion of said flexible valve membrane stretched across the raised portion of said rigid base member, and an entrance port associated with one end of said base member, said raised portion of said base member and said slot means being distal from said entrance port, said entrance port adapted to be in communication with



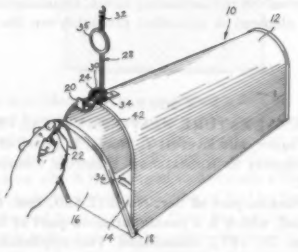
the source of pressure to be controlled, so that when said source of pressure reaches a predetermined level, said pressure is released between said base member and said valve membrane by causing said valve membrane to be displaced from said base member.

4,000,847

MAIL INDICATOR USED IN CONJUNCTION WITH A MAILBOX

Jack L. Duis, 2784 Copp Road, Niles, Mich. 49120

Continuation-in-part of Ser. No. 599,830, July 28, 1975, abandoned. This application Jan. 16, 1976, Ser. No. 649,661
Int. Cl.² G08C *5/00*
U.S. Cl. 232—35 **7 Claims**



1. In combination a mail indicator and a mailbox comprising an elongated shape-retaining flexible member having upper and lower end portions and defining said mail indicator, said member lower end portion terminating in a hook part, said mailbox including a housing means for receiving mail, said housing means including an open front end, a door, means pivotally connecting said door to said housing means for movement between a closed position spanning said housing means open end and an open position exposing said housing means open end, a latch part mounted to said housing means adjacent its said open end, said door including a tab part, said latch part having one end secured to said housing means and another end releasably engaged with said door when the door is located in its closed position, said latch part including an intermediate portion between its said ends offset from said housing means, the lower end portion of said member extending under said latch part intermediate portion between said intermediate portion and housing means and being return bent over said intermediate portion with said hook part interlocking under said intermediate portion, the upper end portion of said member having an upwardly extending signal indicating position, said upper end portion being flexibly downbent and secured between said door and housing means with said door in its closed position, said upper end portion shifting into its

upwardly extending signal indicating position when said door is opened.

4,000,848

REGULATING DRIVE, ESPECIALLY FOR A THERMOSTATICALLY CONTROLLED VALVE SHAFT

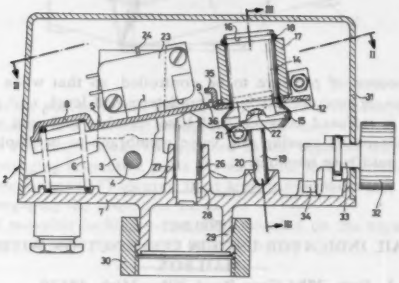
Bernhard W. Braukmann, Am Rosenberg 1, and Rudolf Vollmer, Fr. Holderlinstr. 23, both of D 695 Mosbach, Germany

Filed Apr. 28, 1975, Ser. No. 572,497

Claims priority, application Germany, Apr. 26, 1974, 2420213

Int. Cl.² G05D *23/02*; **F16K** *31/00*

U.S. Cl. 236—68 R **17 Claims**



1. A regulating drive for a thermostatically controlled feed member having a pivotable, spring-loaded actuating lever carrying a control element, the operating member of the said control element being stationary and the mobile element being supported on the actuating lever, characterized in that the control element is mounted pivotably on the actuating lever.

4,000,849

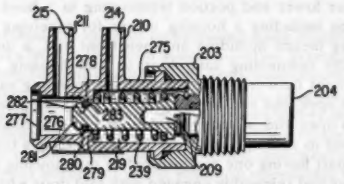
TEMPERATURE RESPONSIVE VALVE

Joseph P. Wagner, and Everett T. Steele, Jr., both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 312,530, Dec. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 221,557, Jan. 28, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,621

Int. Cl.² G05D *23/12*

U.S. Cl. 236—100 **20 Claims**



1. A temperature responsive valve comprising, in combination

a valve body having therein first, second, third and fourth cylindrical chambers of successively smaller diameters axially aligned and extending along at least a portion of the length of the body;

said body including wall means having first, second, third and fourth ports opening respectively into said first, second, third and fourth chambers;

means defining a first valve seat between said first and second chambers, said first valve seat having an opening therethrough via which said first port can communicate with said second port;

means defining a second valve seat between said third chamber and said fourth chamber, said second valve seat having an opening therethrough via which said third port can communicate with said fourth port;

a valve stem within said body and extending through said first valve seat and toward said second valve seat, said stem being movable along a predetermined path;

a first valve element movable with said stem to close said opening of said first valve seat;

a second valve element movable with said stem to close the opening of said second valve seat;

movable means for sealing said second chamber with respect to said third chamber throughout the extent of travel of said stem; and

a temperature responsive means for moving said stem from a first position, in which said first valve element engages and closes said opening of said first valve seat and said second valve element is spaced from said second valve seat, to a second position in which said first valve element is spaced from said first valve seat and said second valve element closes the opening of said second valve seat.

15. In a temperature responsive valve, the combination comprising

a generally hollow casing having open and closed ends and a plurality of spaced flow ports between the ends,

a flow passage in said casing establishing communication between said flow ports,

valve seat means in said flow passage,

movable valve means cooperating with said valve seat means for controlling a fluid flow in said flow passage,

temperature responsive means including a thermostatic power element secured to the open end of said casing and operatively connected to said valve means for moving the same between controlling positions,

said valve seat means including an annular surface joined to a first annular bevelled surface with a second annular bevelled surface on the opposite side of the annular surface from the first annular bevelled surface, said first bevelled surface facing in a direction towards the closed end of said casing,

said movable valve means including a valve stem having one end operated by said thermostatic power element and a free end protruding through and spaced from said valve seat means, an annular seal ring of resilient material fixed on said free end, and

spring means interposed between said stem and said valve seat means biasing the ring into simultaneous engagement with both the first bevelled surface and said annular surface during one of the controlling positions of said element,

said first and second surfaces facilitating fluid flow between said stem and annular surface to establish communication between said ports during another one of the controlling positions of said element.

4,000,850

SOLAR HEATED AND COOLED MODULAR BUILDING

Richard E. Diggs, 12A Road, Carthage, Mo. 64836

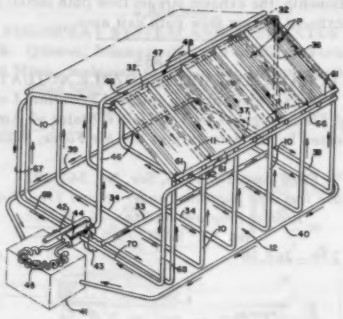
Filed May 14, 1975, Ser. No. 577,359

Int. Cl.² F24J *3/02*

U.S. Cl. 237—1 A **19 Claims**

1. A solar heated and cooled modular building, comprising a frame including prefabricated tubular wall columns and prefabricated tubular roof beams supported on the columns, the columns and the beams being adapted to pass fluid therethrough, first fluid circulating means connected with the columns and beams to circulate a first heat exchange fluid therethrough at a desired temperature to maintain a desired temperature in the building, a plurality of rigid, prefabricated insulated panels secured to and supported on the columns and

beams defining wall and roof structures, respectively, enclosing the building, a plurality of solar panels secured to and supported on the roof panels, second fluid circulating means connected with the solar panels to circulate a heat exchange fluid therethrough to absorb heat from solar energy and to use said heated heat exchange fluid to obtain the desired temperature of the first heat exchange fluid and plates secured to locations on the columns and roof beams which are adjacent each other and connecting those columns and beams to adjacent structure of the building, the plates each having flow passages defined therein to fluidly connect the columns and the beams.



4,000,851

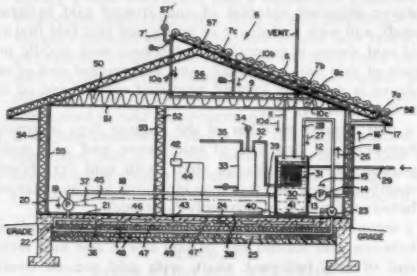
SOLAR-HEATED DWELLING

Volkmar Heilemann, 127 Mountain View Road, Warren Township, N.J. 07060

Filed Nov. 12, 1975, Ser. No. 631,085

Int. Cl.² F24J *3/02*

U.S. Cl. 237—1 A **10 Claims**



1. A solar heating unit comprising in combination: a building structure having floor means for circulating fluid therethrough and for providing a heat-sink reservoir, and floor means comprising concrete having fluid-flow conduits embedded therein, and rocks in a layer beneath and in contact with a lower face of said concrete in heat-flow relationship adapted such that the rocks serve as a heat sink together with said concrete storing thermal energy over extended periods of time, and the building structure having spaced-apart upright wall structures-means for defining an enclosure inhabitable space therebetween mounted on an upper face of the floor means and supportable of overhead structure, and having ceiling means for providing support for upper structure and for insulating said inhabitable space, mounted on said upright wall structures-means above and capping said space, and roof means for providing shelter to the ceiling means and mounted thereabove on said spaced-apart upright wall structures-means and for providing support for solar cells thereon-above; solar heating means for providing solar cells mounted exterior to said building structure with operative exposure thereof to outdoor sunlight source, and for circulating fluid serially to and through the solar cells, and therefrom to and through said floor means, and from the floor means back to the solar cells, in a substantially closed circulation cyclic flow, adapted such that heat becomes extracted from the fluid into the heat-sink-reservoir and thereby provides thermal heat energy to said inhabitable space for the heating thereof, and for providing forced circulation in said closed circulation cyclic flow.

4,000,852

FUEL ATOMIZERS

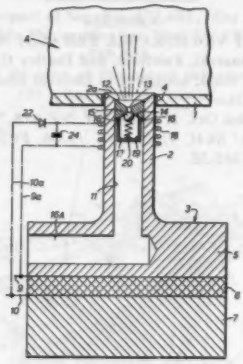
Barrie James Martin, Shenfield, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 24, 1976, Ser. No. 660,929

Claims priority, application United Kingdom, Mar. 5, 1975, 9042/75

Int. Cl.² B05B *1/30, 3/14*

U.S. Cl. 239—102 **3 Claims**



1. A fuel injection system comprising a fuel injection nozzle having a fuel injection orifice, and a vibrator to produce atomization of the fuel injected by the nozzle, the nozzle being equipped at the inlet side of its nozzle orifice with a liquid-retaining valve which is arranged to normally close the nozzle orifice and thus prevent the injection of fuel by the nozzle and which is adapted to move away from the nozzle orifice when the vibrator is activated and thus allow the injection of fuel by the nozzle, the valve being situated in a housing in the nozzle and the housing having biassing means for biassing the valve towards the nozzle orifice when the nozzle is not being vibrated.

4,000,853

SPRINKLER HAVING IMPROVED WATER DISTRIBUTION

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Mar. 29, 1976, Ser. No. 671,716

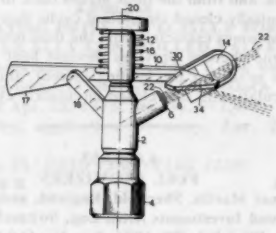
Claims priority, application Israel, Feb. 6, 1976, 48983

Int. Cl.² B05B *3/08*

U.S. Cl. 239—230 **9 Claims**

1. A sprinkler comprising: a spinkler head connectable to a water supply pipe and having a nozzle through which the water issues in the form of a jet; a spring-biassed pivotably-mounted arm impinged by the water jet and oscillated thereby; and a deflector carried by said arm, and oscillated therewith across the path of the water jet so as to be impinged thereby along a line of impingement as the deflector oscillates back and forth along the path of the water jet; said deflector including a lower edge disposed at an angle to and intercepting the line of impingement of the deflector as it oscillates back and forth across the path of the water jet such that the

lower edge of the deflector intercepts an increasing area of the water jet section to deflect it downwardly during one direction of movement of the arm, and a decreasing area of the water jet



section to deflect same downwardly during the opposite direction of movement of the arm, to thereby distribute the sprinkled water substantially uniformly from the sprinkler nozzle during the oscillation of the arm.

4,000,854

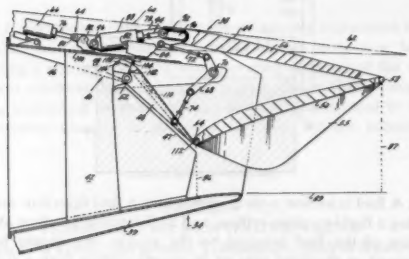
THRUST VECTORABLE EXHAUST NOZZLE

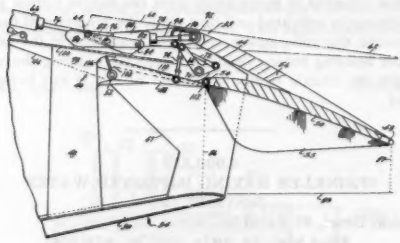
Mieczyslaw Konarski, Fairfield, and Dudley O. Nash, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 2, 1975, Ser. No. 618,796

Int. Cl.[2] B64C *9/30, 9/38, 15/06;* **F02K** *1/12*

U.S. Cl. 239—265.35 **22 Claims**





1. A flight maneuverable exhaust device for use with a gas turbine engine comprising:

first variable position flap means partially defining an exhaust stream flow path having a throat and an exit, said first flap means being pivotably connected to an upstream fixed duct portion for varying exhaust stream flow path area convergence;

second variable position flap means further defining the flow path, said second flap means being downstream of and pivotably connected to the first flap means for providing variable exhaust stream expansion control in a first operating mode and exhaust stream deflection in a second operating mode;

third variable position flap means pivotably connected to the second flap means proximate their respective downstream extremities, said third flap means partially defining a variable contour flight control surface; and

an actuation system operatively connected to at least one of said flap means for synchronously moving said first, second and third flap means to control, in a predetermined relationship, the exhaust stream flow path throat area and the exhaust stream flow path exit area.

4,000,855

BELLCRANK ASSEMBLY, NOZZLE ACTUATOR

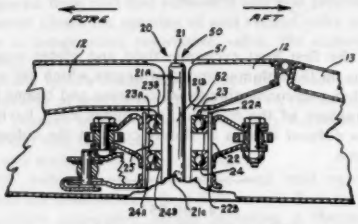
Larry E. Anders, Palm Springs, and Joel F. Sutton, Lake Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 14, 1975, Ser. No. 567,892

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.[2] B64C *15/08*

U.S. Cl. 239—265.39 **4 Claims**



1. A bellcrank assembly, adapted for mounting on, and for actuating, a convergent flap of an exhaust nozzle of a turbojet engine, comprising:

a. a bellcrank shaft having a first end, a middle portion, and a second end;

b. a sleeve having a first end and a second end, with said sleeve disposed external of and around said bellcrank shaft, and with said sleeve so positioned that said first end of said sleeve is generally located near said middle portion of said bellcrank shaft, and said second end of said sleeve is generally located near said second end of said bellcrank shaft;

c. a first bearing member of the angular type interposed between said first end of said sleeve and said middle portion of said bellcrank shaft, with said first bearing member having two races, an inner one and an outer one, between which it is moveably positioned;

d. a second bearing member of the angular type interposed between said second end of said sleeve and said second end of said bellcrank shaft, with said second bearing member having two races, an inner one and an outer one, between which it is moveably positioned;

e. a spacer disposed between said first bearing member and said second bearing member, and abutting said outer races, with said spacer simultaneously interposed between said sleeve and said bellcrank shaft;

f. means for securing said sleeve, said first bearing member and races, said second bearing member and races, and said spacer to said bellcrank shaft;

g. a bellcrank housing subassembly, comprising:

(1) a housing suitably dimensioned and configurated to contain said sleeve, said first bearing member and races, said second bearing member and races, said spacer, and said middle portion and said second end of said bellcrank shaft;

(2) and, a fore bellcrank link arm, an aft bellcrank link arm, and a bellcrank actuator arm, with all said arms fixedly attached to said sleeve, whereby said bellcrank actuator arm is pivotally moveable;

h. means for securing said bellcrank housing subassembly at said second end of said bellcrank shaft;

i. and, means for mounting and securing said first end of said bellcrank shaft to said convergent flap of said exhaust nozzle of said turbojet engine.

4,000,856

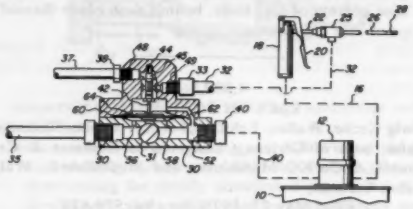
FOG/SPRAY SYSTEM AND APPARATUS

Vernon K. Quarve, Minneapolis, and William Vork, Edina, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Sept. 2, 1975, Ser. No. 609,244

Int. Cl.² B05B 7/12

U.S. Cl. 239—332 **9 Claims**



1. A fog/spray system actuable from a source of pressurized fluid for pumping liquid coating material from a container and delivering same through a trigger-actuable fog/spray applicator, comprising:

a. a fluid-operated pumping means, connected to said applicator and to said coating material container, for pumping said liquid coating material under pressure to said applicator, and wherein said applicator further comprises an internal passage therethrough for passing said coating material and an interior valve having a passage opening and closing position and actuable by said trigger;

b. a fluid control valve having a first valve passage connected between said fluid-operated pumping means and said source of pressurized fluid, said first valve passage having a flow restriction and a diaphragm chamber and diaphragm, with respective sides of said diaphragm being vented upstream and downstream of said flow restriction, and said fluid control valve having a second valve passage with an inlet for pressurized air and an outlet, and a movable valve member in said second valve passage connected to said diaphragm; and

c. a fogging chamber having a first inlet connected to said applicator and a second inlet connected to said fluid control valve second passage outlet, and having an outlet for delivering said fog/spray liquid coating material.

4,000,857

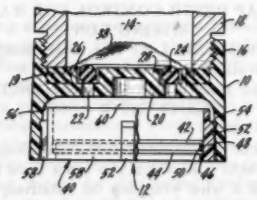
FLOW CONTROL AERATOR

Alfred M. Moen, 25 Lakeview Drive, Grafton, Ohio 44044

Continuation of Ser. No. 489,234, July 17, 1974, abandoned. This application June 30, 1975, Ser. No. 591,635

Int. Cl.² B05B 1/30; F16K 15/08

U.S. Cl. 239—428.5 **18 Claims**



1. A water aerating device including a housing having a water inlet and outlet, screen means associated with said housing outlet, partition means in said housing positioned upstream of said screen means, air passage means in said housing in communication with the downstream side of said partition means, said partition means including a plurality of annularly arranged water passages extending therethrough, circumferential outer wall means integral with said partition means and extending upstream therefrom, circumferential inner wall means integral with said partition means and extending upstream therefrom, an annular flow control member formed of a distortable material positioned between and by said wall means and positioned to partially mask the upstream end of said partition means water passages, said annular member and wall means cooperating with each passage to form entrances thereto on opposite sides of said annular member.

4,000,858

METHOD AND APPARATUS FOR SCREENING AND COMMINUTING DEVICE

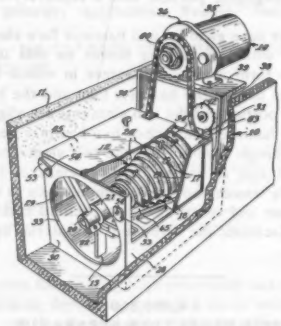
Stanley P. Rudzinski, 1156 S. Lombard Ave., Oak Park, Ill. 60304

Continuation-in-part of Ser. No. 472,681, May 23, 1974, Pat. No. 3,893,923. This application May 23, 1975, Ser. No. 580,135

The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.² B02C 23/36

U.S. Cl. 241—27 **5 Claims**



2. A comminutor, said comminutor including

a housing adapted to be placed in a flow channel in a position to intercept fluids carrying solid materials which must be comminuted,

a rotor in the housing, said rotor having its axis positioned substantially parallel to the flow path of said fluids, and being composed of

an axial shaft assembly and a plurality of rings fixed with respect to and carried by the shaft assembly, said rings being of an increasing diameter in a downstream direction,

each ring carrying a plurality of cutter elements which project radially outwardly from its associated ring,

each ring cutter element being received in an opening in the periphery of its carrying ring, and being held in place by

a wedge assembly including an apertured wedge member having a pair of opposed faces disposed in radially outwardly diverging relation to one another, one face being adapted to be placed in abutting relation to a surface of said opening, the other face being adapted to be placed in abutting relation to a surface of a cutter element located in the opening, and a fastener extending through said aperture in said wedge member and secured to said ring, and

a stationary cutter element carried by support structure integral with the housing,

said stationary cutter element being located adjacent to the

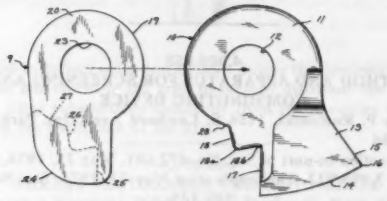
path of travel of each cutter element carried by a ring whereby a cutting action occurs as each cutter element carried by a ring moves past an adjacent stationary cutter element.

4,000,859

TWO-PIECE HAMMER

Richard P. Whitney, East Moline, Ill., assignor to Sivyer Steel Corporation, Milwaukee, Wis.

Filed Feb. 9, 1976, Ser. No. 656,414
Int. Cl.² B02C *13/28*
U.S. Cl. 241—194 **9 Claims**



1. A two-piece hammer for use in a material shredder comprising: (a) a replaceable hammer face element having a hammer pin engaging portion and a material shredding face and (b) a separate reusable hammer peen portion having a hammer pin engaging portion and a relatively heavy body portion;

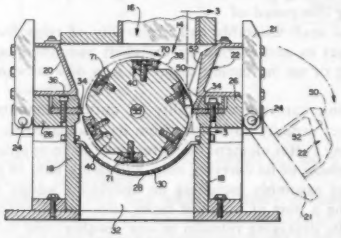
said hammer peen element and hammer face element being provided with interlocking means so that they can be united to form a unitary hammer in which the peen is positioned behind the hammer face and the hammer pin engaging portions of the two elements are aligned so that when the hammer is attached to a hammer bearing member by a single hammer pin the two elements cannot be separated and in operation the weight of the peen is effectively transferred to the hammer face to magnify the momentum and centrifugal force behind said face and to thereby facilitate the shredding of material by said hammer face.

4,000,860

SIZE REDUCTION APPARATUS

Stanley T. Gotham, Somerset, Mass., assignor to Leesona Corporation, Warwick, R.I.

Filed Nov. 13, 1975, Ser. No. 631,734
Int. Cl.² B02C *13/02*
U.S. Cl. 241—242 **6 Claims**



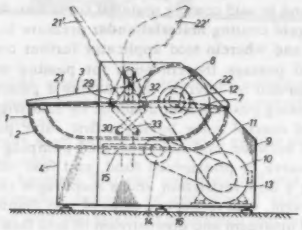
1. A granulator for size reduction of plastic material including heavy parts such as purgings and the like comprising, a chamber, a generally cylindrical rotor mounted within said chamber for rotation about an axis, means for driving said rotor about said axis, cutting means comprising a plurality of knives affixed on said rotor, a bed knife situated for cooperative cutting relationship with said rotor knives as said rotor is driven to effect size reduction of material fed into said chamber, said rotor having a plurality of partial cut out portions each extending along a chord and spaced about the periphery thereof, each of said cut out portions extending continuously along a major portion of the axis thereof and forming an uninterrupted seat having a flat base portion along said chord and an upstanding shoulder portion at the inner terminus thereof for abutting receipt of a rotor knife, each said rotor knife having a continuous heel and base portion and a knife face portion opposite said heel portion, the knife face of at least some of said rotor knives having a plurality of integral spaced blades and bolt means for maintaining said heel portion of said rotor knife against said shoulder portion of said seat and said base portion of said knife against said base portion of said seat, wherein said rotor knife includes a plurality of depressions provided in a top surface of said knife opposite said base portion of said knife, behind each blade thereof for receipt of said bolt means.

4,000,861

VACUUM FOOD MILL

Ludwig Grebe, Wallau, Lahn, and Reiner Grebe, Biedenkopf, Lahn, both of Germany, assignors to Kraemer & Grebe GmbH & Co KG Maschinen- und Modellfabrik, Wallau, Lahn, Germany

Filed May 22, 1975, Ser. No. 579,828
Claims priority, application Germany, May 24, 1974, 2425142
Int. Cl.² B02C *18/12, 18/18*
U.S. Cl. 241—282.1 **8 Claims**



1. In a vacuum food mill or blender for cutting and mixing of food having a vacuum container, means for subjecting same to a source of vacuum, said vacuum container being comprised of a stationary lower part and a removable cover, a receptacle rotatably supported in said vacuum container and a cutter spindle projecting into said vacuum container and having knives thereon for cutting and mixing of the food contained in said receptacle, the improvement comprising wherein said cover of said vacuum container includes hinge means mounted on said lower part and extending transversely over the top of said receptacle and dividing said cover into plural cover sections, each of said cover sections being independently pivotally supported by said hinge means for movement toward and away from said receptacle.

4,000,862

WIRE-WRAP DEPTH CONTROL FOR HAND HELD WIRING GUN

George L. Datwyler, Sal. Lake City, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 25, 1975, Ser. No. 590,229
Int. Cl.² H01R *43/00*
U.S. Cl. 242—7.06 **2 Claims**

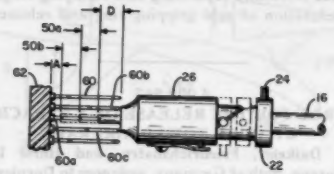
2. A depth control for selectively establishing the depth at which a hand-held gun, which gun has a fixed nose assembly through which a wire wrapping bit rotatively extends, will wrap stripped electrical wire about an electrical-connector pin, comprising:

a collet that may be affixed to said wiring gun, said collet

having a helical groove in an outer cylindrical surface thereof and a plurality of detents within said helical groove that are spaced along the longitudinal axis of said collet;

a level gauge including:

rotating means having an inside cylindrical surface for rotatively mounting about the outer cylindrical surface of said collet;



follower means for extending through said inside surface and into said helical groove;

means compressively securing said follower means upon said rotating means and within said helical groove for determining the axially directioned movement of said level gauge along said collet as said follower means follows said helical groove and comes to rest within a respective one of said detents.

4,000,863

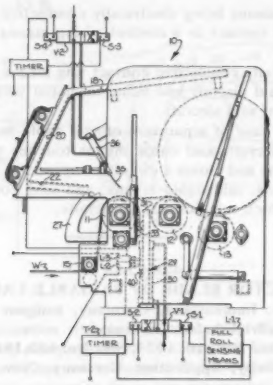
WINDING APPARATUS WITH WRAPPING ARRANGEMENT

John E. Straujups, Lexington, Mass., assignor to Birch Brothers Southern, Inc., Waxhaw, N.C.

Filed June 13, 1975, Ser. No. 586,742

Int. Cl.² B65H *19/20*

U.S. Cl. 242—56 R **9 Claims**



1. A winding apparatus comprising a plurality of elongate driving rolls mounted for rotation about parallel spaced apart axes for guiding forwardly advancing web material to be wound into a roll while supporting the roll of web material at a first winding position and in engagement with one of said driving rolls during initiation of winding and then supporting the roll of web material at a second winding position and in engagement with another of said driving rolls during continuation of winding, means for positioning winding cores at the first winding position for initiation of winding of web material thereon, carriage means movable transversely of the web material between the first and second winding positions, cutting means movable with said carriage means for engaging web material between the first and second winding positions and for severing the web material and forming a leading edge of forwardly advancing web material between the first and second winding positions, means for directing the leading edge of web material rearwardly about a winding core positioned at the first winding position, tucking means mounted for movement between a position withdrawn from the first winding position and a tucking position closely adjacent the first winding position and for engaging a rearwardly directed leading end portion of web material substantially throughout the width thereof for folding the web material about a fold line spaced from the leading edge of the web material while biasing the folded web material into a nip defined between the web material and the winding core at the first winding position, and control means including means for moving said tucking means from the withdrawn position toward the tucking position in timed relation to movement of said carriage means and as a leading end portion of web material is directed rearwardly about a winding core.

4,000,864

METHOD AND MEANS FOR WINDING PRE-CUT BAGS TO FORM ROLLS

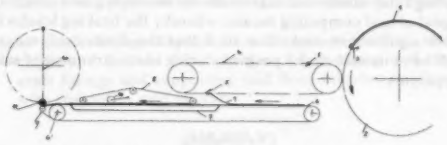
Bernard Kurtz, Haguenau, and Ermes Spizzo, Schiltigheim, both of France, assignors to Les Ateliers de Constructions Mecaniques and C. A. Holweg S.A., both of Strasbourg, France

Filed Aug. 5, 1975, Ser. No. 602,184

Claims priority, application France, Nov. 20, 1974, 74.40370

Int. Cl.² B65H *75/00;* **B65G** *15/00*

U.S. Cl. 242—59 **9 Claims**



1. A process for winding bags previously cut to length, into rolls, comprising depositing each bag on an endless conveyor in partially overlapping relation with a bag previously deposited on said endless conveyor, passing the thus-formed series of partially overlapping bags on said endless conveyor between said endless conveyor and a superposed endless conveyor that moves at the same speed as the first-mentioned endless conveyor, gripping the forward edge of the foremost bag with a winding spindle in a winding station, rotating said winding spindle to roll up on said spindle a series of partially overlapping bags, and moving said winding spindle from said winding station thereby to separate the wound up bags from the next bags in said series of overlapping bags.

4,000,865

CONTROLLED TENSION LET-OFF FOR UNWINDING ROLLS OF MATERIAL

Jack C. Gaskins, Lanett, Ala., assignor to Batson-Cook Company, West Point, Ga.

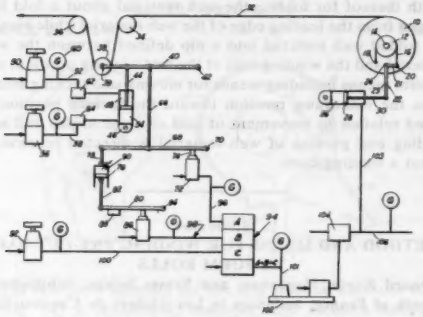
Filed Aug. 27, 1975, Ser. No. 608,184

Int. Cl.² B65H *25/22*

U.S. Cl. 242—75.43 **3 Claims**

1. Apparatus for maintaining uniform tension within a web of material being unwound from a rotatable beam of material, comprising a signal responsive brake operatively associated with said beam of material for retarding the rotation of said beam of material in order to control said tension within said web of material, vertically reciprocating dancer roll means disposed in contact with said web so as to be responsive to a

change in said tension of said web, a plurality of air pressure regulator means for emitting pressure control signals in response to the reciprocal movement of said dancer roll means, lever means interconnecting said dancer roll means and said air pressure regulator means for actuating said air pressure regulator means, dashpot means operatively associated with one of said air pressure regulator means for controlling said pressure control signal of said one of said air pressure regulator means for a predetermined period of time, computing relay means for receiving said signals of said plurality of air



pressure regulator means and for transmitting a resultant signal to said brake for actuation thereof, pneumatic circuit means interconnecting said computing relay and said brake through which said resultant signal is transmitted, and adjustable ratio air pressure regulator means disposed within said pneumatic circuit means and interposed between said computing relay means and said brake for modifying said resulting signal of said computing means, whereby the braking level will have a predetermined value such that the dancer roll means will be at its mid-stroke position during normal running of said apparatus.

4,000,866

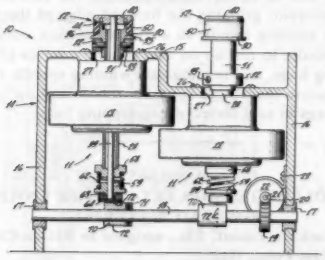
TAPE REEL DRIVE SYSTEM FOR VIDEO RECORDER/REPRODUCER

Gordon Schulz, Villa Park, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Jan. 19, 1976, Ser. No. 650,456

Int. Cl.² G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—203 **10 Claims**



1. A positive gripping reel drive assembly comprising:

a drive shaft;

a motor connected to said drive shaft;

a first clamping ring connected to one end of said drive shaft;

a push rod mounted coaxially with said drive shaft;

a second clamping ring connected to one end of said push rod, adjacent said first clamping ring;

an expandable reel gripping ring mounted between said first and second clamping rings, said gripping ring being adapted to extend into a reel for engaging same, movement of said first and second clamping rings toward each other longitudinally compressing and laterally expanding said gripping ring into engagement with a reel mounted thereon;

means connected between said drive shaft and said push rod for applying a force therebetween to maintain said gripping ring in said expanded condition; and

means for selectibly separating said clamping rings to permit relaxation of said gripping ring and release of said reel.

4,000,867

CONTROL FOR THE RELEASE OF A PARACHUTE WITHIN A TOWED AIRCRAFT

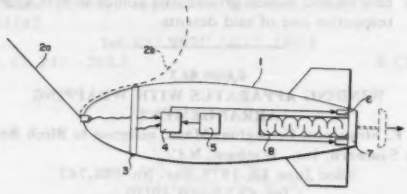
Wolfgang Daikeler, Friedrichshafen, and Horst Deppner, Langenargen, both of Germany, assignors to Dornier GmbH, Germany

Filed Jan. 20, 1976, Ser. No. 650,795

Claims priority, application Germany, Mar. 19, 1975, 2511984

Int. Cl.² B64D *3/00;* **F41J** *9/10*

U.S. Cl. 244—1 TD **4 Claims**



1. A control system for the release of a parachute contained within an aircraft adapted to be towed by cable means secured thereto,

said cable means being electrically conductive and having electrical contact to a control wiring means in said aircraft,

and electrically conductive contact ring means on the contour of said aircraft and being insulated with respect to the skin of said aircraft,

whereby in case of separation of said cable means from a towing aircraft, said cable means touches said contact ring means and closes a circuit composed of said contact ring means, said cable means, and said control wiring means which releases said parachute.

4,000,868

DEFLECTOR BLADE OF VARIABLE CAMBER

Peter Gregor, Immenstaad, Germany, assignor to Dornier GmbH, Friedrichshafen, Germany

Filed Nov. 10, 1975, Ser. No. 630,184

Claims priority, application Germany, Nov. 12, 1974, 2453558

Int. Cl.² B64C *15/06*

U.S. Cl. 244—12.5 **9 Claims**

1. A deflector blade of variable camber comprising:

a. a leading edge portion;

b. a trailing edge portion;

c. an intermediate portion interposed between said leading and trailing edge portions;

d. a crank member;

e. a first pivot hingedly connecting said leading edge portion to said intermediate portion;

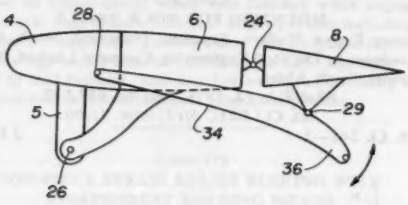
f. a second pivot hingedly connecting said crank member to said leading edge portion;

g. a third pivot hingedly connecting said intermediate portion to said trailing edge portion,

h. a fourth pivot hingedly connecting said trailing edge portion to said crank member,

1. said first, second, third, fourth pivots having respective spaced, parallel axes,

2. the axes of said first and third pivots defining a connecting line intersecting the connecting line defined by



the axes of said second and fourth pivots in a plane perpendicular to said axes,

3. a part of said crank member extending from said second pivot beyond said fourth pivot; and

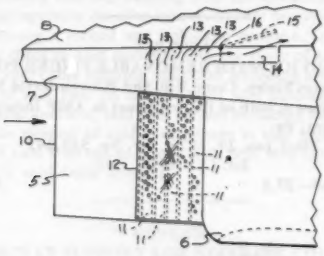
i. actuating means including an actuating member secured to said part of said crank member for angularly moving said crank member about the axis of said second pivot.

4,000,869

STRONG SHOCK BOUNDARY LAYER INTERACTION CONTROL SYSTEM

Wilford F. Wong, Lakewood; Gordon R. Hall, Manhattan Beach; Tatsuo W. Tsukahira, Los Angeles, and Robert D. Sutton, Cypress, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Oct. 21, 1975, Ser. No. 624,374
Int. Cl.² B64D *33/02*
U.S. Cl. 244—53 B **3 Claims**



1. In combination with a supersonic aircraft engine inlet provided with a compression ramp extending forwardly of the opening of said inlet, means suppressing strong shock-induced flow separation occurring from the interaction of turbulent boundary layer air on said ramp and normal shock increasing to Mach 2 strength, comprising:

a. means defining a row of vertically disposed plenums in the interior of said ramp, said plenums extending across the region relative to the leading edge of said ramp and the opening of said inlet where said flow interaction occurs,

b. a fixed, flat porous plate covering said plenums to bleed said turbulent boundary layer air into said plenums,

c. separate duct means leading from each of said plenums to a region of low pressure adjacent to the exterior of said aircraft to exhaust air from said plenums, and

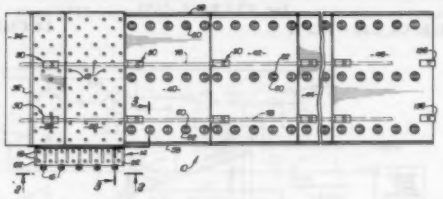
d. variable position valve means for incrementally controlling the exhaust exit of said duct means.

4,000,870

MODULAR SYSTEM FOR QUICK CONVERSION OF AIRCRAFT PASSENGER COMPARTMENTS TO CARGO BAGGAGE/COMPARTMENTS

David J. Davies, Everett, Wash., assignor to Western Gear Corporation, Lynwood, Calif.

Filed Sept. 8, 1975, Ser. No. 610,999
Int. Cl.² B64C *1/20;* **B64D** *9/00*
U.S. Cl. 244—118 R **27 Claims**



1. A panel for use in a quickly convertible modularized system for securing cargo in passenger compartments of aircraft, said panel comprising:

an elongated flat floor member having an upper side providing a floor surface and a lower side to face an aircraft floor,

quick connect and disconnect fittings in said floor member for engagement with aircraft fittings to secure said floor member to said aircraft,

cargo container stops in said floor member to hold cargo containers in place,

conveying means on said floor member for providing easy movement of cargo containers thereon,

guide means on said floor member for guiding cargo containers into place and for holding said containers in place, and

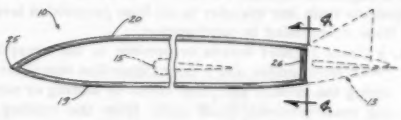
said quick fittings depend from frames supporting said stops, and include shear plungers for engaging said aircraft fittings and supporting said floor member in shear with respect to said aircraft.

4,000,871

AIRPLANE FUSELAGE STRUCTURE

Kermit M. DeHaai, R.R. No. 1, Monroe, Iowa 50170

Filed July 31, 1975, Ser. No. 600,736
Int. Cl.² B64C *1/08*
U.S. Cl. 244—119 **12 Claims**



1. An airplane body comprising:

a longitudinally extending fuselage, said fuselage being substantially concave along the bottom thereof;

a first strut member attached to said fuselage along one side of said concave bottom and extending substantially from the front of said fuselage to a point forward of the rear end of said fuselage;

a second strut member attached to said fuselage along the other side of said concave bottom and extending substantially from the front of said fuselage to a point substantially forwardly of the rear end of said fuselage, said first and second strut members having ends terminating substantially forwardly of the rear end of said fuselage and being spaced apart by a substantial distance at said terminating ends, whereby said first and second struts form skid means for emergency landing purposes;

a pair of wings attached to said fuselage; and

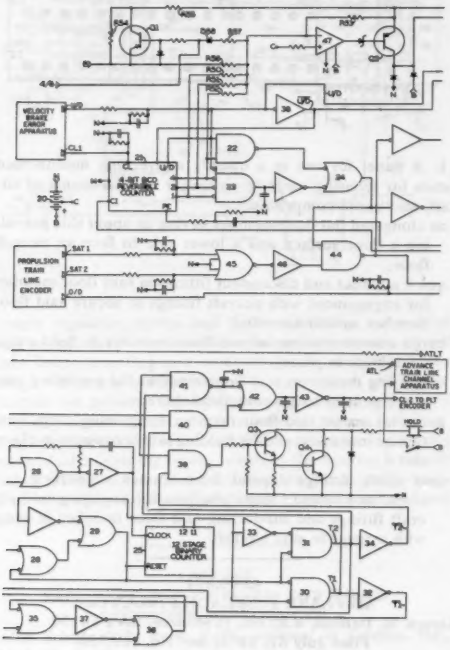
a tail attached to said fuselage rearwardly of the first and second strut members.

4,000,872

ADVANCE TRAIN LINE REGISTER FOR A TRAIN SPEED REGULATION SYSTEM

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 27, 1975, Ser. No. 581,370
Int. Cl.² B61L *3/20*
U.S. Cl. 246—182 R **14 Claims**



1. An advance train line register apparatus for use in a train speed regulation system which also includes on each train a propulsion train line encoder to set base propulsion levels for the train, comprising in combination,

a. a count register means responsive to the reception of clock input pulses and a count direction signal for registering the level of the pulse count by adding or subtracting each received clock pulse from the existing pulse count registry in accordance with the up/down condition of the count direction signal, and operable between zero and a predetermined maximum count limits,

b. said count register means connected for receiving input clock pulses when a speed regulation difference exists between desired and actual train speeds and a count direction signal conditioned in accordance with the under or over status of the speed difference,

c. a converter means connected for receiving the existing pulse count from said register means and operable for converting the total count into a stepped output signal having preselected levels increasing as the count total becomes larger and vice-versa,

d. an advance train line output means connected for transmitting said stepped signal for changing the propulsion level of said train in successive car by car steps to a higher or lower level as said stepped signal increases or decreases, respectively, and

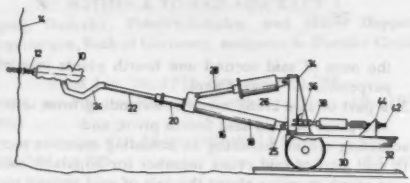
e. a clock logic means controlled by said register means and responsive to either a maximum or a zero pulse count limit for generating another distinctive clock pulse to actuate a shift to a higher or lower base propulsion level for said train as the maximum or zero limit is reached, respectively, by said count register means.

4,000,873

MOUNTING FOR ROCK DRILLS

Trevor Evelyn Wallace, Sandton, Transvaal, South Africa, assignor to The Steel Engineering Company Limited, Roodepoort, South Africa

Filed Feb. 12, 1976, Ser. No. 657,537
Int. Cl.² E21C *5/11, 9/00, 11/00*
U.S. Cl. 248—2 **2 Claims**



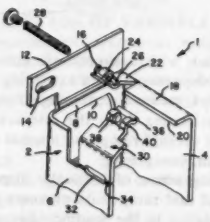
1. A mounting for rock drills comprising a drill feed leg composed of a fluid operated piston and cylinder, a vertical support mounted for rotation about an axis, an adjustable counterbalancing arm, with the rear end of the feed leg, the support and the arm forming a triangle which can swing about an axis parallel to the vertical support and with the front end of the feed leg extending beyond the triangle and carrying a mount for a rock drill, so that the shape of the triangle changes as the mount is raised and lowered, a lever arm extending from the support, a fluid thrustor, the thrust of which can be regulated to counteract the forces tending to move the feed leg sideways, acting between the lever arm and fixed structure, and a common regulated fluid supply for the feed leg and the thrustor so that the bias exerted by the thrustor is proportional to the thrust applied by the feed leg.

4,000,874

WIRING DEVICE WITH REMOVABLE FINGER PORTION

Richard James Finley, Camp Hill, and Warren David Nauman, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 29, 1975, Ser. No. 545,242
Int. Cl.² H02G *3/08*
U.S. Cl. 248—27.1 **3 Claims**



1. A wiring device, comprising: a wire receiving portion, a bracket having a projecting portion engageable on an obverse surface of a wallboard, a finger portion of said bracket being initially assembled in close conformity with the periphery of said bracket to allow insertion of said bracket into an opening of a wallboard, said finger portion being pivotable by a threaded fastener to project outwardly beyond the periphery of said bracket, said finger portion being capable of advance-

ment along said fastener into engagement against a reverse surface of a wallboard whereby the wallboard is gripped between said projecting portion and said finger portion to mount said wiring device in said wallboard opening, stop means provided on said bracket, said finger portion being pivotable into engagement against said stop means to project outwardly beyond the periphery of said bracket, said finger portion being capable of advancement along said fastener while engaged against said stop means, and said finger portion including a first fastener alignment portion freely receiving said fastener therethrough and a fastener securing portion adjustably secured to said fastener, said bracket having a projecting ear provided with a second fastener alignment portion.

4,000,875

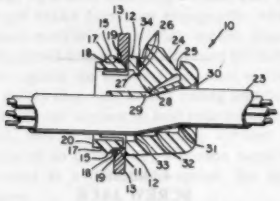
ONE-PIECE STRAIN RELIEF BUSHING WITH INDEPENDENT HOLDING MEANS

William Jemison, Summit; Salvatore Orlando, Rahway, and Richard Fink, Basking Ridge, all of N.J., assignors to Heyman Manufacturing Company, Kenilworth, N.J.

Continuation-in-part of Ser. No. 477,780, June 11, 1974. This application May 9, 1975, Ser. No. 574,621

Int. Cl.² H01R *13/58*

U.S. Cl. 248—56 **10 Claims**



1. A one-piece strain relief bushing including means independent of its strain relief function to hold itself locked in an aperture, said strain relief bushing including an opening therethrough through which a cable may be received, and an aperture extending into said bushing from the circumference of its body, said aperture opening into said cable receiving opening, a cam having a locked and unlocked position, said cam extendable through said aperture into the body of said bushing and into said cable opening, said cam including a hinge at one portion of said cam on said body of said bushing and at an edge of said aperture, said cam further including means to grip at another portion of said cam, means in said bushing to engage said cam's means to grip and to hold said cam locked in position in said cable opening.

4,000,876

ONE-WAY SUPPORT FOR STEERING COLUMN

Hideyuki Usui, and Toshimitsu Kimura, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Nov. 4, 1974, Ser. No. 520,952

Claims priority, application Japan, Nov. 7, 1973, 48-128084

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² F16M *13/02;* **B60R** *21/02*

U.S. Cl. 248—205 R **1 Claim**

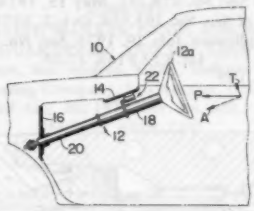
1. A "one-way" support for a steering column comprising:

a mount bracket having fixed thereon two elongated tubular collars spaced and extending in parallel with each other;

a support member in the form of a rod, said rod having a generally V-shaped intermediate portion and two end portions extending in the same direction from said V-shaped intermediate portion into said collars and in parallel with each other;

said two tubular collars surrounding circumferentially said two end portions, respectively, and spaced therefrom defining therewith annular interspaces, respectively; and

two prestressed elastomeric sleeves positioned between said tubular collars and said end portions in said annular interspaces, respectively; said mount bracket being supported in use on an instrumental panel of a vehicle in which a steering column assembly is installed and said V-shaped intermediate portion carrying securely thereon an upper tube portion of the steering column assembly, such that the steering column assembly thereby provides an arrangement whereby application of an axial force to the assembly in a sense tending to cause forward displacement of the upper tube portion urges said V-shaped inter-



mediate portion forwardly and causes said end portions to slip forwardly out of said collars, and upon the application of a lateral force with respect to said axial force, said end portions compress said elastomeric sleeves radially with consequent absorption of said lateral force;

said support member having flanges on said end portions, respectively, engaging fo ward ends of said tubular collars; and said rod being deformable that upon the application of said lateral force, the upper tube portion of said steering column assembly deforms said V-shaped intermediate portion with efficient absorption of said lateral force.

4,000,877

MOULDING

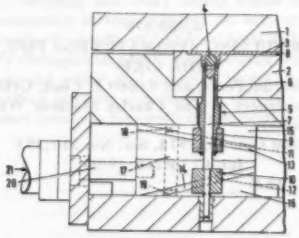
Terence H. C. Shead, Chorley Wood, and David G. Wills, St. Albans, both of England, assignors to Worldwide Plastics Development Limited, Wolverhampton, England

Filed Apr. 9, 1975, Ser. No. 566,343

Claims priority, application United Kingdom, Apr. 25, 1974, 18179/74

Int. Cl.² B29C *11/00*

U.S. Cl. 249—82 **5 Claims**



1. Apparatus for forming a moulded product comprising a reinforcement encapsulated in a plastic moulding material, the apparatus comprising a mould, said mould including a plurality of support pins for the temporary support of said reinforcement in said mould, and at least one of said pins being retractable into the surface of said mould, wherein at least one reservoir is provided in said mould, each reservoir being formed in or around a retractable support pin, opening into said mould, extending inwardly of said mould surface, and containing therein a piston, the reservoir being positioned so

that during an initial part of a moulding operation some of said plastics moulding material enters the reservoir, and means for retracting said pin and means for moving said piston outwardly on retraction of said pin to force said moulding material out of the reservoir into the vicinity of the part of said mould previously occupied by said pin.

4,000,878

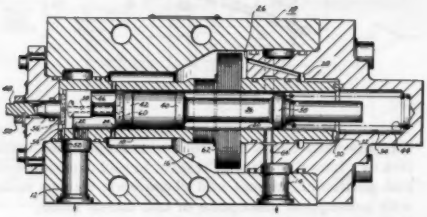
QUIETING MEANS FOR A FLUID FLOW DEVICE

Ralph L. Vick, Granada Hills, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Division of Ser. No. 470,251, May 15, 1974, which is a continuation of Ser. No. 293,956, Oct. 2, 1972, abandoned. This application July 29, 1975, Ser. No. 600,021

Int. Cl.² F16K *47/08*

U.S. Cl. 251—127 **9 Claims**



1. A flow control device for installation in a fluid transfer system including a spool valve member controlling a flow of fluid under high pressure such that a potentially destructive or noise-generating fluid pressure differential exists;

a rigid structure surrounding said spool valve member comprising a series of stacked annular disks having abutting faces, some of said disks including a pattern of elongated slots therethrough defining areas of individual chambers and some of said disks having orifices therethrough of substantially smaller area than said slots, said slots and orifices alternating in pattern across said disks to produce a plurality of individual passageways across said structure, some of said disks having imperforate areas adjacent said slots to confine flow in defined streams in each of said passageways such that each such stream always changes direction to flow across the same orifice disk,

movement of said spool valve serving to expose varying numbers of said disks to said flow of fluid.

4,000,879

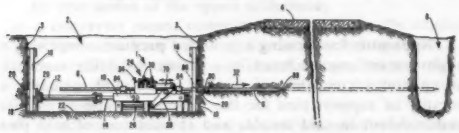
PUSHING OR PULLING APPARATUS FOR PIPE, ROD OR THE LIKE

James Scott Martin, Perry, and Robert E. Cook, Orlando, both of Okla., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Oct. 23, 1974, Ser. No. 517,393

Int. Cl.² E21B *19/00*

U.S. Cl. 254—29 R **9 Claims**



1. Apparatus for pushing or pulling an elongated member, such as a pipe, rod or the like, through a subterranean area comprising:

a frame adapted to be mounted within a subterranean pit and having extensible means to engage opposed walls of the pit to retain said frame in a desired operating position within the pit, said extensible means comprising a hydraulically extensible jacking means operable by pressurized hydraulic fluid supplied remote from said jacking means and remote from the subterranean pit for said frame to exert and maintain pressure against the opposed walls of the pit in fixing the apparatus during its operation;

reversible gripping means mounted on said frame to be cooperable with the elongated member and be movable longitudinally relative to said frame, said gripping means having a gripping member whereby the elongated member is grippingly engaged when said reversible gripping means is moved in a gripping direction and is disengaged when said gripping means is moved in an opposite direction relative to said frame, said gripping member being shiftable to reverse the gripping direction of said gripping means; and

hydraulically extensible means connected between said frame and said reversible gripping means for imparting movement to said gripping means relative to said frame wherein pushing of the elongated member is effected when said reversible gripping means is moved in said gripping direction and pulling effected when said gripping member is shifted to reverse the gripping direction.

4,000,880

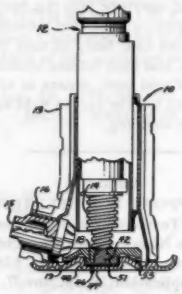
SCREW JACK

Richard S. Graafsma, Benton Harbor, Mich., assignor to Auto Specialties Manufacturing Company, St. Joseph, Mich.

Division of Ser. No. 544,384, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,362, April 26, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,854

Int. Cl.² B66F *3/16*

U.S. Cl. 254—103 **7 Claims**



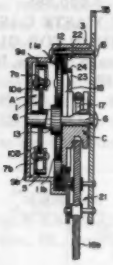
1. A screw jack for lifting autos and the like, comprising a housing, a load member at least partially extensible and retractible relative to the housing, a rotatable screw member adapted to extend and retract the load member, a toothed gear fixed to the screw member for rotation therewith, and means for engaging the gear teeth and causing gear and screw member rotation, the gear having a hub, a planar face, teeth disposed around the gear circumference, and a generally truncated, conical undersurface, the jack further comprising a base plate including a well extending above outer portions of the plate and adapted to receive and journal the gear hub, and a truncated conical surface adjacent the well adapted to generally conform the undersurface of the gear.

4,000,881

SLOWDOWN ESCAPING APPARATUS

Kouichi Matsumoto, Tokyo, Japan, assignor to Matsumoto Kiko Co., Ltd., Tokyo, Japan

Filed June 19, 1975, Ser. No. 588,302
Int. Cl.² B66D 5/04
U.S. Cl. 254—157 2 Claims



1. In a slowdown escaping apparatus comprising a casing having a brake drum, rotational braking means disposed in the casing, said braking means including a brake disk and a plurality of centrifugal brake members engageable with the brake drum, rotational motion transmitting means disposed in the casing and connected to the brake disk and including a plurality of planetary gears, an internal gear and a pinion gear, a grooved rope pulley disposed in said casing and connected for transmitting rotational motion to said rotational motion transmitting means, and a rope extending around the pulley, whereby in case of an emergency a person supported on the rope can descend at a controlled speed, the improvement which comprises:

said brake disk has a plurality of pairs of circumferentially spaced-apart fan-shaped guide portions projecting therefrom and defining a plurality of circumferentially spaced recessed portions, each of said centrifugal brake members being movably positioned in one of said recessed portions and having a brake lining engageable with the brake drum, each of said centrifugal brake members including a U-shaped base spanning the brake disk, said base having a pair of legs extending toward the brake disk and an outer arcuate connecting web extending between said legs with said brake lining being mounted on said web, and a pair of pins extending between the legs of said base and adapted to contact the respective guide portions of the associated recessed portion, whereby when said brake disk is rotated in either a clockwise or a counterclockwise direction, the corresponding one of said pair of pins is pressed against the corresponding one of said guide portions and said brake lining is pressed against said brake drum.

2. In a slowdown escaping apparatus comprising a casing having a brake drum, rotational braking means disposed in the casing, said braking means including a brake disk and a plurality of centrifugal brake members engageable with the brake drum, rotational motion transmitting means disposed in the casing and connected to the brake disk and including a plurality of planetary gears, an internal gear and a pinion gear, a grooved rope pulley disposed in said casing and having a portion carrying said planetary gears for transmitting rotational motion to said rotational motion transmitting means, and a rope extending around the pulley, whereby in case of an emergency a person supported on the rope can descend at a controlled speed, the improvement which comprises:

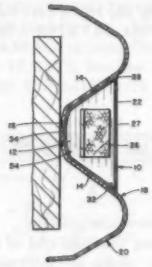
a shield plate located in said casing and dividing same into a first chamber containing said grooved rope pulley and a second chamber separate from said first chamber and containing said braking means and said rotational motion transmitting means, said shield plate including an L-shaped flange portion arranged adjacent to the outer periphery of said portion of said grooved rope pulley carrying said planetary gears, said flange portion having a predetermined dimension whereby said portion of said grooved rope pulley remains within said L-shaped flange portion and dust in said first chamber is prevented from entering into said second chamber even when said grooved rope pulley is displaced axially.

4,000,882

CONTRASTING MARKER PANEL FOR HIGHWAY GUARDRAILS AND THE LIKE

Hugh V. Penton, San Marino, Calif., assignor to California Metal Enameling Company, Los Angeles, Calif.

Filed Aug. 28, 1975, Ser. No. 608,516
Int. Cl.² A01K 3/00
U.S. Cl. 256—13.1 10 Claims



1. In a contrasting marker panel for highway guardrails and the like, the guardrails being of the type having a generally U-shaped cross section recess therein extending continuously longitudinally thereof and generally transversely facing traffic flow; the marker panel comprising: a longitudinally extending main body having a generally vertical front surface and vertically spaced, upper and lower side surfaces; said body being at least internally formed of force crushable material; said body side surfaces being located generally conforming to and abutable against complementary surfaces of the guardrail recess with said body totally within and vertically spanning said recess, said body front surface being located spaced rearwardly of forward extremities of said recess; securement means for fastening said body totally within said guardrail recess; contrasting surface portions on said main body exposed generally forwardly of said main body and the guardrail and clearly distinguishing from the guardrail when said main body is fastened within said guardrail recess, said body contrasting surface portions comprising a majority of body surfaces exposed generally forwardly of said body and said guardrail.

4,000,883

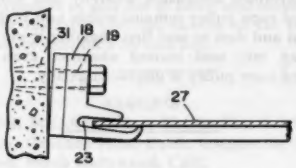
RAILING CONSTRUCTION

Robert H. Murdock, Kensington, Calif., assignor to NEF Systems, Richmond, Calif.

Filed Oct. 1, 1975, Ser. No. 618,566
Int. Cl.² E04H 17/14
U.S. Cl. 256—65 7 Claims

1. A railing assembly comprising a rail member having a laterally extending web portion and a mounting bracket for engaging said web portion and securing said rail member to a structural member, said mounting bracket including a lateral

slot for receiving said web portion, and securance means for securing said mounting bracket to said structural member with



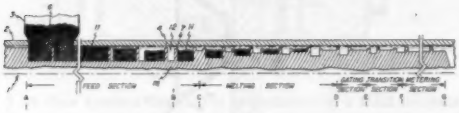
said lateral slot aligned obliquely with respect to said web portion for binding engagement thereof.

4,000,884

EXTRUDER SCREW

Chan I. Chung, 2483 Whitehall Court, Schenectady, N.Y. 12309

Filed July 25, 1975, Ser. No. 599,004
Int. Cl.² B29B 1/10
U.S. Cl. 259—191 10 Claims



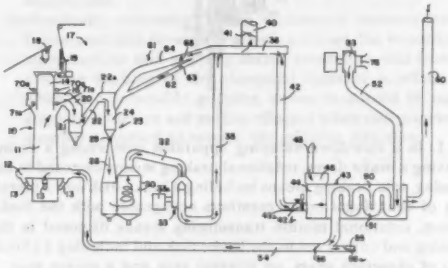
1. An extruder screw comprising:
a feed section along the inlet end of said screw:
a melting section along an intermediate section of the screw:
at least one pair of substantially parallel, helical, primary and secondary threads of substantially constant pitch, integral with a core, each of said threads having a leading edge and a trailing edge;
said primary thread of the pair:
originating at the beginning of said feed section to form a feed channel, defined by the leading edge of the primary thread and the trailing edge of the adjacent, downstream primary thread;
continuing through said melting section;
having a substantially constant diameter in both the feed section and the melting section;
said secondary thread of the pair:
originating in the downstream half of the feed section by its beginning edge arising from the floor of said feed channel without causing significant interference to the material flow from the feed channel;
continuing through the melting section;
having a substantially constant diameter in both the feed section and the melting section, which is less than the diameter of the primary thread of the pair in the same two sections:
the feed channel being divided by said beginning edge of the secondary thread into an open-ended melt channel, defined by the leading edge of the primary thread and the trailing edge of the secondary thread of the pair, and an open-ended solids channel of larger cross-sectional area than that of said melt channel, defined by the leading edge of the secondary thread and the trailing edge of the adjacent, downstream primary thread;
the root diameters of the melt channel, said solids channel and the feed channel, measured at the origin of the secondary thread, being substantially equal to each other;
the initial root diameter of the melt channel progressively increasing to the downstream end of the feed section to a value which is no greater than the diameter of the secondary thread in the same section and, thereafter, progressively decreasing in the melting section;
the root diameter of the solids channel progressively increasing in the melting section to a value which is no greater than the diameter of the secondary thread in the same section.

4,000,885

CUPOLA FURNACE WASTE GAS RECUPERATIVE SYSTEM AND METHOD FOR OPERATING SAME

William A. VanDril, Chicago Heights, Ill., assignor to Whiting Corporation, Harvey, Ill.

Filed Nov. 18, 1974, Ser. No. 524,543
Int. Cl.² C21B 7/22
U.S. Cl. 266—83 6 Claims



3. In an open top cupola installation comprising an open top cupola with waste gas collecting and cleaning means and a waste gas latent heat recuperative system, said cupola having, means for introducing a variable flow of blast air into the lower portion thereof, waste gas collecting means at the top portion thereof and below the top opening therein, means for sensing and controlling the flow of said blast air, means for sensing and controlling the pressure of waste gas flowing through said waste gas collecting means; cleaning means operatively connected downstream from said collecting means including wet type dust particle removing means, exhaust fan means operatively connected downstream from said cleaning means, waste gas combustion means downstream from said exhaust fan means, and heat exchange means downstream from said combustion means operatively connected in heat exchange relation with the incoming blast air, the improvement comprising having the optimum subatmospheric pressure in said collecting means determined by said flow sensing and controlling means with said pressure sensing and controlling means being operatively responsive thereto, having as the means for controlling the inflow of ambient air into the open top of said cupola as a substantially fixed proportion of the incoming blast air and consequently as a substantially fixed proportion of the waste gas flow, a recirculating duct means including valving means therein connecting the downstream side of said exhaust fan means with the entry portion of said waste gas cleaning means, and said valving means being operatively responsive to said pressure sensing and controlling means for preventing explosions inside said waste gas collecting and waste gas cleaning means.

5. In a method of operating an open top cupola installation including an open top cupola, a wet-type waste gas cleaning system and a latent heat waste gas recuperative system, said method including the steps of: introducing a variable flow of blast air into the lower portion of said cupola; drawing gas into said cleaning and recuperative systems through a waste gas collecting means at the top portion of said cupola and below the top opening therein; measuring the flow of said blast air, measuring the pressure of waste gas flowing inside said gas collecting means; cleaning said waste gas in said cleaning system; raising the pressure of said clean waste gas in exhaust fan means to a level sufficiently high to cause flow of said clean waste gas into a combustor downstream from said ex-

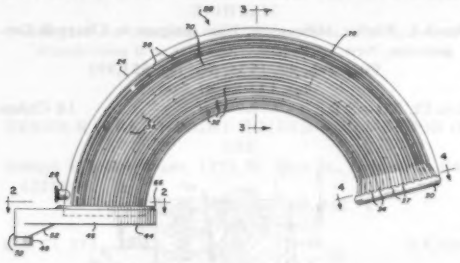
haust fan means; burning said clean waste gas in said combustor; and exchanging heat from said burned waste gas to said incoming blast air downstream from said combustor, the improvement comprising proportionalizing the flow of incoming blast air with the flow of indrawn ambient air through the open top of said cupola by recirculating at least a portion of the flow of said clean waste gas from a point downstream of the exhaust fan means to the inlet portion of said gas cleaning system, and regulating the recirculating flow by determining the optimum subatmospheric pressure in said gas collecting means according to the flow of incoming blast air, and operating valving means to control said recirculation in response to the pressure in said waste gas collecting means for maintaining a substantially fixed proportion of air in the waste gas regardless of the flow of said incoming blast air and preventing explosions in said waste gas collecting and cleaning means.

4,000,886

FURNACE EXHAUST DUCT

Frank N. Johnson, Fulton, Ill., assignor to J. T. Cullen Company, Fulton, Ill.

Filed Mar. 24, 1975, Ser. No. 561,254
Int. Cl.² C21B 3/00
U.S. Cl. 266—147 **19 Claims**



10. A water cooled furnace exhaust duct for use with a blast furnace or the like, comprising:

a duct wall formed by a plurality of adjacent cooling conduits, the axis of each cooling conduit forming an integral part of the duct wall being generally parallel to the duct axis;

a support, coolant inlet conduit connected to at least some of the cooling conduits and for supporting the exhaust duct adjacent the furnace, said support coolant inlet being substantially larger than each of the cooling conduits; and

a manifold connected on the furnace end of the coolant inlet conduit for distributing the coolant to the smaller cooling conduits to thereby provide a self-supporting, water cooled exhaust duct for the furnace.

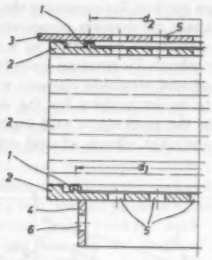
4,000,887

DEVICE FOR LOW-WARP HARDENING OF ANNULAR SEALING MEMBERS

Ruf Max, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Wurtt, Germany

Filed May 7, 1976, Ser. No. 684,009
Claims priority, application Germany, May 9, 1975, 2520697; Sept. 20, 1975, 7529806
Int. Cl.² B23K 19/00
U.S. Cl. 266—274 **3 Claims**

1. Fixture for low-warp hardening of thin-walled annular sealing members of hardenable metallic materials, having a C-shaped cross section and capable of being charged in a tempering furnace or the like, comprising; the fixture consisting of a plurality of stackable trays having an annular rim on top and, radially within said rim, an annular web to accommodate a sealing member, the height of the web being at least equal to that of the rim and greater than the height of the sealing member, and the under-side of the next tray being flat



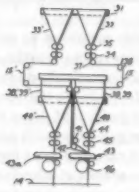
in the neighborhood of the web and presses the sealing member down on the web.

4,000,888

WEB SEVERING DEVICE

Frank H. Gardner, 828 Highview St., Joplin, Mo. 64801, and David L. Dimmitt, 638 Marin Ave., Ontario, Calif. 91761

Filed July 17, 1975, Ser. No. 596,813
Int. Cl.² B41F 13/56
U.S. Cl. 270—21 **7 Claims**



1. A device for severing an endwise traveling web of a printing press or the like comprising

a web severing blade,

spring means for actuating said blade through a web severing movement from a retracted position,

first latch means for latching said blade in said retracted position,

means for actuating said first latch means, to allow said blade to move through said severing movement,

second latch means for additionally latching said blade in said retracted position, and

a manually operable control device,

said device being movable to a first position, means interconnecting said control device with said blade for concurrently moving said blade to said retracted position,

said device being movable to a second position to actuate said second latch means to latch said blade in said retracted position, and

said device being movable to a third position to release said second latch means from said blade.

4,000,889

CAM-OPERATED PHASING MECHANISM FOR A COLLATOR

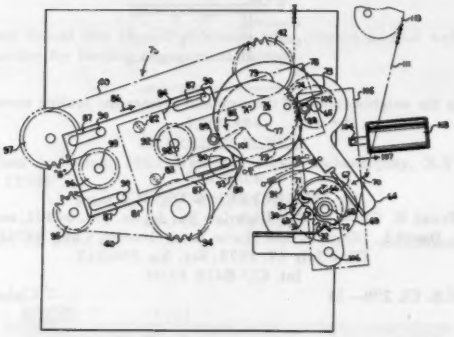
Hans C. Mol, Wilton; Leroy H. Byrne, Waterbury, and Arnold Fassman, Westport, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 6, 1975, Ser. No. 619,652
Int. Cl.² B65H 32/045
U.S. Cl. 270—58 **6 Claims**

3. A drive chain mechanism for a rotary drum collator having a rotatable withdrawing means for removing sheet material from pockets in rotatable drum, said withdrawing

means having at least one rotatable element disposed adjacent said drum and rotatably driven in a phase relationship with respect to rotation of the drum to allow said element to properly enter the drum pockets for removing sheet material therefrom, said drive chain mechanism comprising:

a drive chain operatively supported by a plurality of rotatable sprocket wheels for rotating and advancing the phase relationship of said rotatable element with respect to the drum so as to accommodate for the depletion of sheet material from the pockets as said drum rotates, certain ones of the sprocket wheels of said drive chain mecha-



nism being movably mounted so as to effect an operative change in select operating lengths of said drive chain;

cam follower means operatively connected to said movable sprocket wheels for moving the sprocket wheels to effect an operative change in said drive chain; and

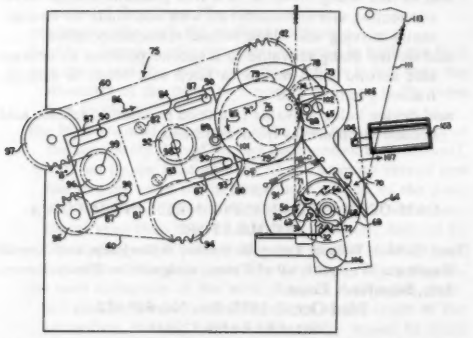
a camming means engageable with said cam follower means for displacing said cam follower means, so as to move the movably mounted sprocket wheels into effecting an operative change in the select operating lengths of the drive chain, whereby the drive chain will advance the phase relationship of said withdrawing means with respect to said drum.

4,000,890

PAPER THICKNESS ADJUSTMENT DEVICE FOR A COLLATOR

Franklin J. Calderazzo, Norwalk, and Arnold Fassman, Westport, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 6, 1975, Ser. No. 620,106
Int. Cl.² B65H *39/045*
U.S. Cl. 270—58 **9 Claims**



1. A rotary drum collator for forming sheet material into collations, said rotary drum collator comprising:

a rotatable drum having pockets for containing quantities of sheet material;

a withdrawing means having at least one rotatable element disposed adjacent said drum for removing the sheet material from the pockets of said drum;

drive means for rotating said rotatable element and said drum in a phase relationship which allows correct entry of the rotatable element into a drum pocket;

phasing means operatively connected to said drive means for changing said phase relationship as said drum rotates to correct for depletion of sheet material in said drum pockets;

advancing means operatively connected to said phasing means for varying the rate of change of the phase relationship of the rotation of said rotatable element with respect to the rotation of said drum, so as to accommodate for the depletion of sheet material of a given thickness from the pockets of said drum; and

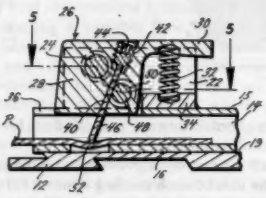
adjusting means operatively connected to said advancing means for selectively adjusting the rate at which said advancing means varies said phase relationship, whereby said phase relationship is varied in accordance with varying rates of depletion of sheet material of different thicknesses.

4,000,891

BACK-UP BRAKE ASSEMBLY FOR A PARTITION STRIP FEEDING MECHANISM IN A PARTITION FABRICATING MACHINE

Frank L. Klafka, Milwaukee, Wis., assignor to Clevepak Corporation, New York, N.Y.

Filed Feb. 28, 1975, Ser. No. 553,972
Int. Cl.² B65H *5/00*
U.S. Cl. 271—8 R **18 Claims**



1. A back-up brake assembly for a partition feeder mechanism for preventing back-up movement of a partition strip fed therepast, said assembly comprising a partition guide having a guide surface for movement of a partition strip therealong from a receiving end to a forward end, a pivot arm, means for mounting the arm for pivotal movement about a generally vertical axis, said arm having an end adapted for engagement with a partition strip as it moves therepast, means resiliently biasing said engaging end toward said guide surface for engagement with a partition strip as it moves past, said guide surface having a recess therein adjacent the engaging end of the pivot arm, the portion of the partition strip overlying the recess being urged into said recess by said engaging end under a force tending to urge the partition strip to back up.

4,000,892

NOTE STORAGE APPARATUS

Frank A. Novak, Seven Hills, and Anthony H. Dolejs, Bedford Heights, both of Ohio, assignors to Ardac, Inc., Willoughby, Ohio

Filed Jan. 22, 1974, Ser. No. 435,481
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² B65H *29/46*
U.S. Cl. 271—180 **25 Claims**

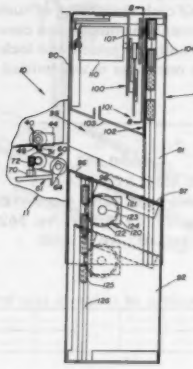
1. A note storage apparatus, comprising:

a stacker assembly,

a collector located in said stacker assembly for receiving the note,

a push bar assembly movably mounted for rolling guided contact in said stacker,

a coffer assembly located in said stacker, and



said push bar assembly selectively contacting the note and transferring it to said coffer assembly.

4,000,893

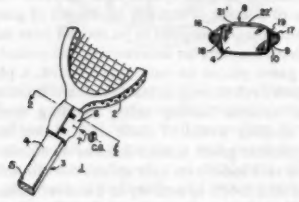
TENNIS RACKET WEIGHT HOLDER AND METHOD OF USE

Raleigh Winslow Evans, 1173 W. First St., Columbus, Ohio 43212

Filed June 2, 1975, Ser. No. 582,719

Int. Cl.² A63B *69/38*

U.S. Cl. 273—29 A **6 Claims**



1. A tennis racket accessory that adds weight at a selected position on a tennis racket and allows the player to position and remove the weight on tennis rackets of different sizes, comprising a flexible material,

said holder having first and second opposite ends and extending lengthwise a sufficient distance to wrap around a tennis racket handle, with said ends overlapping each other,

said holder having a width dimension along the racket handle length,

said holder comprising two, spaced pockets extending in said width dimension direction, said pockets each having a weight therein, said weight being in the shape of a cylinder with a lengthwise dimension greater than the diameter and having the cylinder axis generally in the width dimension direction,

each of said pockets being of sufficient size to permit said weight to roll inside said pocket along the holder lengthwise dimension over a distance that permits each of said weights to be moved inside said pocket by hand to opposite sides of the racket handle and to be properly positioned for the contour of the handle sides, and to be moveable angularly inside said pocket to line up with the direction of the respective racket handle side,

means on said overlapable holder ends to removably fasten said ends together after said holder has been wrapped around the racket handle and said weights are rolled in said positions to press tightly said weights against the racket handle sides and retain said holder on said handle.

5. A method of using a tennis racket accessory that adds weight at a desired location on the tennis racket handle for racket handles of various cross-sectional dimensions and configurations, said accessory comprising a flexible material holder having first and second opposite ends and extending lengthwise a sufficient distance to wrap around a tennis racket handle, with said ends overlapping each other, said holder having a width dimension along the racket handle length, said holder comprising two, spaced pockets extending in said width dimension direction, said pockets each having a weight therein, said weight being in the shape of a cylinder with a lengthwise dimensions greater than the diameter and having the cylinder axis generally in the width dimension direction, each of said pockets being of sufficient size to permit said weight to roll along the lengthwise dimension in said respective pocket over a distance that permits each of said weights to be moved by hand to opposite sides of the racket handle and to be properly positioned for the contour of the handle sides and to be moveable angularly to line up with the direction of the respective racket handle side, and means on said overlapable holder ends to fasten said ends together after said holder has been wrapped around the racket handle and said weights are rolled into said positions and thereby tightly press said weights against the racket handle sides and retain said holder on said handle, the steps comprising,

1. loosely wrapping said holder around said racket handle at a location where it is desired to add weight,
2. rotating each of said weights in said pockets to move said weights to press against opposite sides of said handle at a position suitable for the configuration of the handle sides, to maintain said weights in position, each of said weights being positioned to have its axis parallel to the handle side and extending along the handle length, and
3. completing the wrapping of said holder around said handle to have said holder ends overlapping fastened, to tightly wrap said holder to said handle.

4,000,894

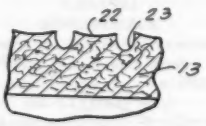
GAME BALL

Kenneth B. Butzen, Des Plaines, Ill., assignor to Pepsico, Inc., Purchase, N.Y.

Filed June 23, 1975, Ser. No. 589,189

Int. Cl.² A63B *41/00, 45/02*

U.S. Cl. 273—65 EG **5 Claims**



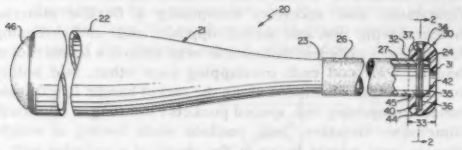
1. An inflatable play ball comprising a flexible cover, and valve means for introducing air into said ball, said cover having a pebble grain configuration including raised pebble surfaces separated by depressions between the individual pebble surfaces, the upper ends of said raised pebble surfaces having either a substantially flat or concave configuration, said raised pebble surfaces extending about the entire periphery of the ball and being integral therewith, said pebble grain configuration increasing the dynamic friction characteristics of the ball thereby improving the handling characteristics of the ball.

4,000,895

BALL BAT

Irvin C. Scott, Jr., and George F. Swenck, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 18, 1975, Ser. No. 605,660
Int. Cl.² A63B *59/06*
U.S. Cl. 273—72 A **2 Claims**



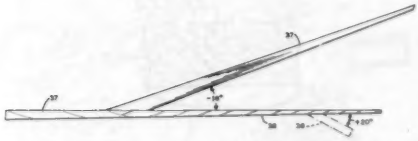
1. A ball bat comprising, a tubular metallic body having a hitting portion and a handle portion with said handle portion terminating in an outer end portion having a pair of aligned holes therein, a disc-like knob having spaced outer and inner end surfaces interconnected by an outwardly convex rounded edge portion, said knob having a handle portion receiving opening extending therein from said inner surface toward said outer surface and having a pair of aligned holes therein, said outer end portion of said handle portion being disposed in said opening with said holes in said knob being in aligned relation with said holes in said outer end portion, said knob being made of an elastomeric material, said knob having a particular thickness between its inner and outer surfaces and said handle portion receiving opening extending into said knob a distance less than said particular thickness and being defined by serrations in said knob which define the periphery of said opening and provide a surface area for engaging said outer end portion of said handle portion, one of said pair of said aligned holes in said knob extending from the outwardly convex rounded edge portion thereof and communicating with said opening therein and the other of said pair of aligned holes in said knob extending into said knob from said opening and forming a blind hole therein, and an expansion type pin extending through said holes in said outer end portion and said holes in said knob to hold said knob fixed to said handle portion by mechanical spring action of said pin; said elastomeric material of said knob allowing partial radial expansion thereof and compression of said serrations to provide an interference fit between said knob and handle portion.

4,000,896

COMPOSITE GOLF CLUB SHAFT

Kristina N. Lauraitis, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Continuation of Ser. No. 379,686, July 16, 1973, abandoned. This application July 17, 1975, Ser. No. 596,796
Int. Cl.² A63B *53/10*
U.S. Cl. 273—80 R **6 Claims**



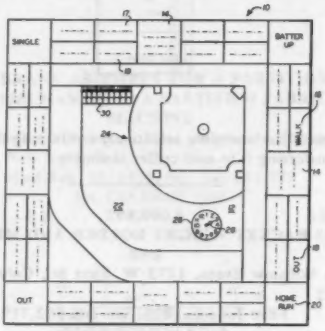
1. A fiber reinforced plastic tapered tubular golf club shaft comprising at least one inner layer of longitudinally extending carbonaceous fibers extending along the longitudinal axis of the shaft and a plurality of angularly disposed layers of carbonaceous fibers successively disposed over said inner layer; some of the angularly disposed layers having a length less than that of the shaft, the fibers in each one of said angularly disposed layers being substantially parallel, each layer of fibers in said angularly disposed layers being oriented at a different angle relative to the fibers of an adjoining layer in which at least some of said different angles are between plus 10° and plus 30° and between minus 10° and minus 30° relative to the longitudinal axis of the shaft with at least one of said angularly disposed layers extending the full length of the shaft, all of said layers forming the golf club shaft being of carbonaceous fibers impregnated with a resinuous binder in a cured state whereby all of said layers are unitarily joined and locked together and stress applied to any one layer is transmitted to all the other layers.

4,000,897

GAME APPARATUS

David S. York, 2 Beechwood Lane, Garnerville, N.Y. 10923

Filed Mar. 27, 1975, Ser. No. 562,667
Int. Cl.² A63F *3/00*
U.S. Cl. 273—93 C **1 Claim**



1. A game apparatus consisting essentially of a game board having a plurality of defined spaces each marked with indicia representative of a mode of activity in respect of game play, a plurality of game pieces adapted to be moved over said spaces by a player, chance means for determining the extent of movement of said game pieces on said game board, a plurality of card decks, each deck having at least one card therein, each of said cards in a deck having solely spelling words listed thereon, the spelling words of each deck being selected to represent a different grade school level of academic achievement, in which said indicia on said spaces contain information representative of a mode of activity in a conventional game of baseball, said defined spaces are positioned sequentially about the periphery of the playing surface of said game board, and the central portion of said game board is provided with a representation of a conventional baseball field.

4,000,898

HAND-HELD BASKETBALL GAME DEVICE

Terry A. Cooter, 1585 W. Dakota Ave., Denver, Colo. 80223

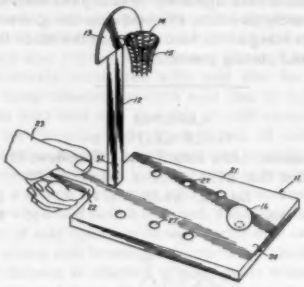
Filed Nov. 24, 1975, Ser. No. 634,833
Int. Cl.² A63B *65/12*
U.S. Cl. 273—101 **10 Claims**

1. A basketball game device comprising:

a movable paddle-like member having a grip portion adapted to be gripped by the hand of a player for hand movement, said member having a playing surface on one side with a plurality of ball-launching pockets at selected positions thereon and spaced from one another each pocket adapted to receive and position a ball at one of a plurality of selected points on the playing surface; and

a post mounted upright on said member, said post having a basket spaced a selected distance from the playing surface by said post and arranged substantially parallel to said playing surface to locate said pockets at different

locations relative to said basket whereby a ball positioned in one of said pockets is launched toward the basket by a



movement of said member by a player gripping said grip portion.

4,000,899

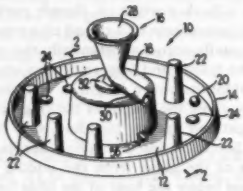
GAME DEVICE

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed May 16, 1975, Ser. No. 578,004

Int. Cl.² A63F 7/10

U.S. Cl. 273—101 **2 Claims**



1. A game device, comprising: a game board the top of which defines a playing surface with retaining means about the playing surface, a 360° rotary ball propelling device mounted on the game board and having a ball receiving portion disposed generally centrally of a vertical axis of rotation for receiving play balls individually and immediately propelling a ball outwardly therefrom through an elongated, generally horizontally extending chute portion under centrifugal force, a set of play balls adapted to be individually placed into and propelled radially from the ball propelling device, a plurality of individual upright and upwardly elongated target members positionable on the playing surface about the ball propelling device for engagement by a ball propelled by the ball propelling device in an attempt to knock over the target members, wherein said upright target members have recesses in the bottoms thereof, and said playing surface includes a plurality of bosses thereon about the ball propelling device for positioning in said recesses to define proper positions for the target members, said ball propelling device being mounted on top of a housing mounted on the playing surface so as to elevate the chute portion of the ball propelling device above the playing surface so as to propel a ball through the air in an attempt to strike one of said target members at a point above the playing surface in said attempt to knock over the target members, and constant speed power means disposed within said housing in operative association with the ball propelling device thereabove for continuously and uniformly rotating the ball propelling device during the play of the game whereby a player may selectively place a ball in the powered ball propelling device in a timed relationship to permit the device to immediately propel the ball outwardly therefrom through the air toward a selected target member so that a player can effectively aim his "shots" by properly timing the placing of a ball in the propelling device in an attempt to knock over selective ones of said target members.

4,000,900

CUE-GAME AND SLIDING DISK FOR SAME

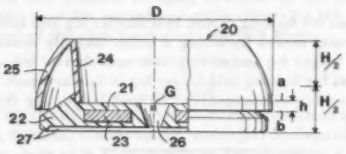
Cyrill George Léhmann, Grenljusbacken 21, X, 117 45 Stockholm, Sweden

Filed Jan. 10, 1975, Ser. No. 540,132

Claims priority, application Sweden, Jan. 28, 1974, 7401086

Int. Cl.² A63F 3/00

U.S. Cl. 273—126 R **11 Claims**



11. A cue-game comprising a table having a substantially horizontal playing surface and being surrounded by uncushioned walls, a plurality of game pieces adapted for sliding movement on said playing surface, and at least one cue for projecting said pieces over said playing surface, each of said game pieces comprising a circular, generally disk-shaped body having uppermost and lowermost surfaces, said body having a vertical axis that is substantially normal to the horizontal plane of said playing surface, and a total height that is less than the maximum diameter of said body, said maximum diameter being confined within a circumferential relatively narrow zone that is vertically spaced from both the uppermost and the lowermost surfaces and has an upper limit which is located at a level which is below the median level of the total body height and forming a caroming surface, said body including a central body portion having an upper limit at said uppermost surface of said body, and an annular outer skirt portion encircling said central body portion and projecting outwardly and downwardly from said upper limit thereof to define a radially resilient upwardly tapered sleeve surrounding at least a portion of the height of said central body portion in radially spaced relationship thereto and forming a cue-striking surface on said game piece, said sleeve converging upwardly toward said vertical axis of said central body at an angle of at least 15°, and said un-cushioned walls having a height that is less than the total height of each of said game pieces and an inwardly facing game piece-reflecting rebound surface leaning inwardly over said playing surface at an angle less than said first-mentioned angle.

4,000,901

RING PUZZLE

Raul Flores, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 8, 1975, Ser. No. 593,933

Int. Cl.² A63F 9/08

U.S. Cl. 273—158 **3 Claims**

1. A ring puzzle capable of being easily disassembled, which comprises:

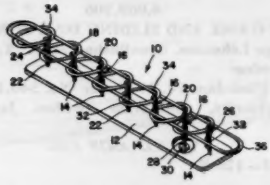
a. a flat elongated base having a plurality of longitudinally aligned apertures therethrough;

b. a plurality of inverted U-shaped members, each U-shaped member having a base, a longer leg, and a shorter leg bent inwardly towards said longer leg thereby forming an opening between said legs and said bases, a free end of each said longer leg pivotally mounted through each said aperture;

c. a closed ring member looped through each said opening

of each said U-shaped member, each said ring member looped over an adjacent said U-shaped member;

d. a closed end loop member slidably extending through said ring members and straddling said U-shaped members;



e. means for holding closed said shorter leg and said longer leg, said means including a collar slidably mounted on said longer leg and sliding over said shorter leg; and

f. means for holding said longer leg in said aperture thereby preventing disengagement of said longer leg from said base.

4,000,902

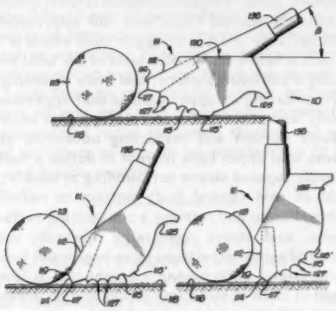
GOLF PUTTER WITH IN-LINE AIMING AND DIRECTIONAL CONTROL CAPABILITIES

Sonnie Joseph Perkins, 2320 186th Ave. NE., Redmond, Wash. 98052

Continuation-in-part of Ser. No. 550,471, Feb. 18, 1975, abandoned. This application Jan. 15, 1976, Ser. No. 649,337

Int. Cl.² A63B *53/00*

U.S. Cl. 273—164 **9 Claims**



1. In a golf putter, the combination that comprises

a. a shaft, a transversely horizontally elongated blade supported at one end of said shaft, said blade having a substantially vertical planar front face, a turf engaging bottom face located immediately rearwardly of the front face, and a rear face which extends arcuately rearwardly and upwardly above the level of said bottom face, said front face, bottom face and rear face each being transversely horizontally elongated, said rear face rotatably engaging the turf in blade supporting relation as the blade is tilted rearwardly, and

b. a putting path sighting device carried by the blade and projecting angularly upwardly and rearwardly relative thereto, said blade having a rearwardly tilted position in which the front face is elevated, and said device extends rearwardly and substantially horizontally,

c. there being projection means on the blade facing downwardly to engage the turf as the blade is tilted rearwardly, to prevent twisting of the blade during such tilting, said projection means carried by said transverse end portions of the blade, whereby the putter may be tilted rearwardly on said projection means, by tilting the shaft rearwardly and downwardly, and the sighting device brought into alignment relative to a cup on a green, and the putter may then be tilted back upwardly by tilting the shaft upwardly and forwardly to rotate the blade on the green turf and without twisting of the blade to bring the blade front face into aligned putting position.

4,000,903

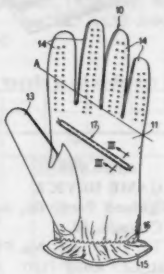
GOLF GLOVE

Arthur P. Swanson, 1454 Estate Lane, Glenview, Ill. 60025

Filed Oct. 21, 1975, Ser. No. 624,379

Int. Cl.² A63B *71/14*

U.S. Cl. 273—166 **9 Claims**



1. In a golf glove for the upper hand of a golfer, having a palm portion, a back portion, a thumb portion and finger portions, the improvement of a raised elongated narrow ridge extending diagonally across substantially the entire palm portion between the thumb and finger portions and secured to the palm portion along its entire length, a one-piece core in said ridge extending along the length of the ridge effective to hold the ridge upright and against buckling, said ridge being substantially parallel to a line extending across the palm and finger portions of the glove from the middle knuckle of the forefinger to just below the base of the little finger and spaced from said line a distance substantially equal to the diameter of the grip portion of a golf club shaft to be gripped by the upper-hand of a golfer, and said narrow ridge having a width insufficient to form an obstruction between the palm portion of the glove and the grip portion of the club shaft.

4,000,904

TEE OFF DEVICE

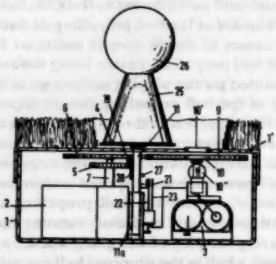
Karel Arnold Poortman, De Brei 4, Ingen, Netherlands

Filed June 26, 1975, Ser. No. 590,689

Claims priority, application Netherlands, July 4, 1974, 7409067

Int. Cl.² A63B *69/36*

U.S. Cl. 273—183 A **3 Claims**



1. A tee-off device comprising a housing having an upper

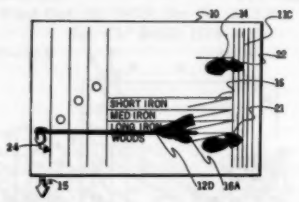
wall formed with a pair of openings passing therethrough and said housing also having a lower wall situated below said upper wall to define therewith an interior space in said housing, a rotary disc situated in said housing adjacent said upper wall thereof and carrying a plurality of transparent members of different colors for movement past one of said openings while said rotary disc rotates, drive means situated in said housing and operatively connected with said disc for rotating the latter, a lamp situated beneath said disc in said housing in alignment with said one opening at said upper wall of said housing for directing light through one of said transparent members when said lamp is illuminated, circuit means operatively connected to said lamp for illuminating the latter and including a switch for closing said circuit means to illuminate said lamp when said switch is closed, a shaft extending through the other of said openings of said upper wall of said housing carrying above said housing a platform on which a tee with a golf ball thereon is adapted to rest, guide means situated in said housing and supporting said shaft for vertical movement, said switch being located adjacent said shaft and the latter carrying a cam for closing said switch during vertical movement of said shaft, urging means situated in said housing and operatively connected with said shaft for urging the latter to an upper position when a golf ball is not carried by a tee on said platform, said urging means responding to placing of a golf ball on a tee on the platform to free the shaft for downward movement to a lower position, said cam operating said switch to illuminate said lamp during upward movement of said shaft when a golf ball is displaced from a tee on the platform, and arresting means situated in said housing and operatively connected with said shaft for cooperating with said drive means to arrest the operation thereof when said shaft moves upwardly in response to the force of said urging means upon removal of a golf ball from a tee, so that light of a given color will flash through said one opening in said upper wall of said housing to be visible to a golfer when a golf ball is driven from a tee on the platform.

4,000,905

PRACTICE MAT FOR GOLFERS

Milan J. Shirhall, 6134 Montgomery Court, San Jose, Calif. 95135

Filed Sept. 24, 1975, Ser. No. 616,198
Int. Cl.² A63B *69/36*
U.S. Cl. 273—187 A **1 Claim**



1. A golf practice mat for indicating the placement and alignment of the forward and rearward feet of the player, the placement of the ball and the direction of travel of the club head as the golf club is swung to hit the ball, including the following:

a mat for placement on the ground, said mat including the following indicia;

a series of first lines indicating heel placement of the player;

a series of second lines each having one end intersecting the nearest of the first lines and extending perpendicular thereto such that the other end thereof indicates the point of placement of the ball for different iron and wood shots with indicia adjacent each second line indicating the club to use with the associated line;

a plurality of positions marking the placement of the ball for various golf clubs;

a third line extending perpendicular to the series of first lines and generally towards the ball placement points and spaced from the second lines in the direction opposite to the direction of ball travel for indicating alignment of the rear foot of the player; and

a plurality of fourth lines extending from the intersection of such of said second lines and said nearest of the first lines and generally towards said points of placement of the ball and the intended direction of travel of the ball to indicate alignment of the forward foot of the player; and

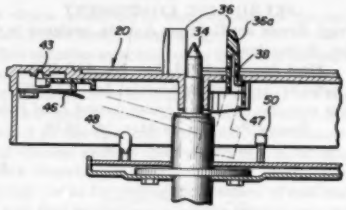
a plurality of spaced fifth lines extending parallel to said first lines and passing through the areas of placement of the ball to indicate the direction of club head travel as the club is swung to hit the ball whereby the player can position his heels on a selected first line, align his forward and rearward feet relative to the fourth and third lines respectively and practice swinging at a ball on the placement points near the second line while observing the accurate travel of the club head along the fifth lines.

4,000,906

TWO-SPEED AUTOMATIC PHONOGRAPH

Leon F. Kolosko, Cheektowaga, and Alvin S. Topolski, Tonawanda, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Apr. 18, 1975, Ser. No. 569,213
Int. Cl.² G11B *25/04*
U.S. Cl. 274—9 A **7 Claims**



1. In a two-speed automatic phonograph, the combination comprising: a turntable with a plurality of holes therein to receive disc records of different types having relatively large and relatively small record holes respectively to be played at first and second speeds respectively, record hole size sensing means comprising a plurality of separate independently movable elements projecting through said holes and cooperable with a record on said turntable to sense the center hole size thereof, drive means coupled to said turntable for driving said turntable either at said first speed or at said second speed depending on the record hole size sensed by said sensing means, and speed control means responsive to said sensing means and coupled to said drive means for turning said turntable at operating playing speed for the type of record placed thereon, and fixed detecting means coupled with said speed control means and coacting with said elements sequentially and requiring positional coincidence of a plurality of said elements to effect speed control.

4,000,907

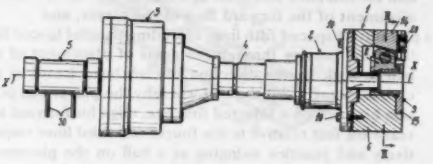
CHUCKS FOR MACHINE TOOLS, SUCH AS LATHES AND GRINDING MACHINES

Michel Pascor, Orleans, France, assignor to Equipements de Machines-Outils Spemo, Nanterre, France

Filed Jan. 20, 1975, Ser. No. 542,426
Claims priority, application France, Feb. 1, 1974, 74.03394
Int. Cl.² B23B *31/16*
U.S. Cl. 279—121 **2 Claims**

1. A chuck for a machine tool comprising a frame mounted on a spindle with an axis of rotation, a cam support mounted for sliding movement in said frame parallel to said axis, clamp-

ing jaw guides mounted on said frame for radial sliding movement relative to said axis and guided along substantially their entire length, said guides carrying female ramps on opposite sides of each of a plurality of portions of said cam support, said ramps being inclined in relation to said axis, means for sliding said cam support parallel to said axis, and means carried by said cam support radially to displace said jaw guides,



said radial displacing means comprising cylindrical pivots mounted for rotation in and relative to said portions of said cam support about axes transverse to said spindle axis, each said pivot having double lateral flats projecting on opposite sides of each of said portions of said cam support into said female ramps and in sliding engagement therewith, said lateral flats being disposed within the projected cylindrical contour of the associated said cylindrical pivots.

4,000,908

SKI BINDING COMPONENT

Erwin Weigl, Brunn am Gebirge, Austria, assignor to Gertsch AG, Zug, Switzerland

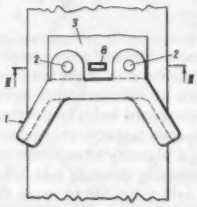
Filed Jan. 22, 1974, Ser. No. 435,570

Claims priority, application Austria, Jan. 22, 1973, 517/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² A63C 9/08

U.S. Cl. 280—623 **8 Claims**



1. A ski binding device for holding at least one of the toe and heel of a ski boot into engagement with an upper surface of a ski, comprising:

base means mounted on said ski and having at least vertical guide means thereon;

vertically movable ski boot engaging means vertically movably mounted on said vertical guide means, at least one of said base means and said ski boot engaging means having horizontal guide means thereon intersecting said vertical guide means;

movable first lock means movably mounted on said horizontal guide means, said ski boot engaging means having second lock means cooperable with said first lock means to effect securement of said vertically movable ski boot engaging means in a selected position relative to said ski;

resilient means for continuously resiliently biasing said ski boot engaging means in a vertically upward direction; and

release means operatively connected to said first lock means for effecting a movement of said first lock means out of cooperating relation with said second lock means to permit a vertical movement of said ski boot engaging means relative to said ski and said ski boot due to the urging of said resilient means.

4,000,909

SKI BOOT SNOW SCRAPER

Sidney C. Coale, 4305 Bluebird, Union Lake, Mich. 48085

Filed June 20, 1975, Ser. No. 588,871

Int. Cl.² A63C 11/18

U.S. Cl. 280—11.37 E **1 Claim**

1. A ski boot snow scraper for attaching to a ski pole, said scraper comprising:

blade means having a length substantially longer than its width, said blade means being a rigid member,

attaching means integrally formed with said blade means for attaching said blade means to the ski pole near one end thereof and between the handle and the snow basket on the ski pole, said attaching means having an arcuate form for conforming to and overlapping the pole and having a length longer than said blade means and said blade means is positioned intermediate the ends of said attaching means forming securing ends at each end of said attaching means,

said securing ends receiving a pair of strap members respectively placed on said securing ends, and encircling the ski pole and securing said scraper rigidly thereto.

4,000,910

VEHICLE PROVIDED WITH A FLUIDIC ACCELEROMETER

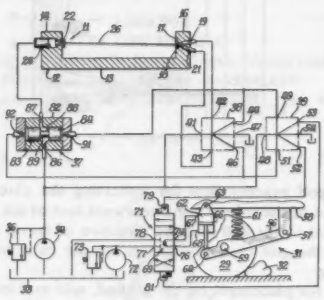
Dale H. Unruh, and Frederick D. Proksch, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 437,205, Jan. 28, 1974, Pat. No. 3,900,042. This application Feb. 18, 1975, Ser. No. 550,810

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B60G 11/56

U.S. Cl. 280—710 **1 Claim**



1. In a vehicle having a fluidic system disposed on said vehicle for detecting acceleration and for producing an acceleration signal in response thereto, the combination comprising:

a vehicle wheel, suspension means for attaching said wheel to said vehicle while providing for vertical movement of said wheel relative to said vehicle, resilient means for exerting a force between said vehicle and said suspension means for urging said wheel towards a predetermined

vertical position relative to said vehicle, an extensible and contractible fluid cylinder coupled between said vehicle and suspension means,

fluid flow receiver means having a first flow receiver port, and a second flow receiving port with the center of said second flow receiving port being spaced apart from the center of said first flow receiving port in the direction along which acceleration is to be sensed,

fluid jet forming nozzle means having a flow orifice,

means for supplying fluid under pressure to said nozzle means whereby a fluid jet is ejected therefrom,

support means holding said nozzle means in a spaced-apart relationship from said receiver means with said jet being directed towards said receiver ports across an unobstructed gap, whereby deflection of said fluid jet relative to said receiver means in response to acceleration is accompanied by an increase of flow through one of said ports and a decrease of flow through the other thereof,

fluidic signal output means communicated with said receiving ports for generating fluidic signals in response to brief departures of the pressure at said receiving ports from a predetermined value,

a fluid pressure piloted cylinder control valve connected between said cylinder and a source of high pressure fluid and having a normal position at which said cylinder is isolated from said source of high pressure fluid, said control valve having a first pilot means for responding to a relative increase of fluid pressure at said first receiving port by supplying high pressure fluid to said cylinder to raise said wheel relative to said vehicle and having second pilot means responsive to a relative increase of fluid pressure at said second receiving port by supplying high pressure fluid to said cylinder to lower said wheel relative to said vehicle, and

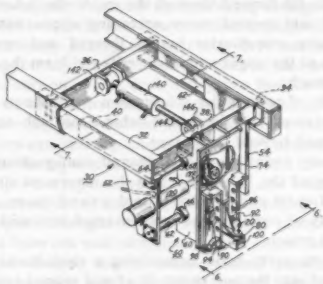
compensating means for varying the flow passage to said jet nozzle to restore said receiver port pressures to said predetermined value in response to relatively prolonged departures of said pressures from said predetermined value.

4,000,911

HITCH MECHANISM FOR TOWING AND MANEUVERING MOBILE HOMES AND MODULAR HOME SECTIONS

Charles A. Weber, Elkhart, Ind., assignor to Bock Products, Inc., Elkhart, Ind.

Filed Oct. 16, 1975, Ser. No. 622,810
Int. Cl.² B60D 1/18
U.S. Cl. 280—468 **13 Claims**



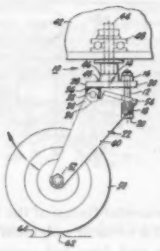
1. A hitch mechanism for towing and maneuvering mobile homes, mobile and modular home sections and similar vehicles, comprising a carriage, a means for mounting said carriage on the rear of a towing vehicle, a hitch head mounted on said carriage for connection to the towed vehicle, a first power means for moving said hitch head laterally, a second power means for moving said hitch head vertically, and a third power means for moving said hitch head forwardly and rearwardly, whereby the adjacent end of the mobile home or mobile or modular home section connected to said hitch head can be moved laterally, vertically and longitudinally without moving the towing vehicle on which the hitch mechanism is mounted.

4,000,912

SHOCK ABSORBER

James E. Donald, and Gerald I. Weigt, both of Davis, Calif., assignors to MSE Corporation, Mountain View, Calif.

Filed Feb. 21, 1975, Ser. No. 551,901
Int. Cl.² B60G 11/24
U.S. Cl. 280—701 **8 Claims**



1. A shock absorber to dampen impact forces normally transmitted to a body, comprising:

a. a first member attached to the body and having a first and second end portion;

b. a second member having a first and second end portion, the first end portion of said first member hingedly attached to the first end portion of said second member; said second ends of said members free of intermediate shock absorbing means.

c. spring means for urging the rotation of said second ends of said first and second member toward one another and resisting rotation of said second ends of said members away from one another, said spring means including a spring, engaging said second end of said second member and a pin fixedly attached to the second end of said first member and passing through an elongated opening in said second member said pin moving freely within said elongated opening along its axis of elongation with the rotation of said second ends of said members away from one another, said pin remaining fixedly attached to said second member during rotation; said spring also engaging said pin.

d. arm having an end attached to said second member to receive impact forces such that said second ends of said first and second members rotate away from one another upon reception of an impact force by said arm.

4,000,913

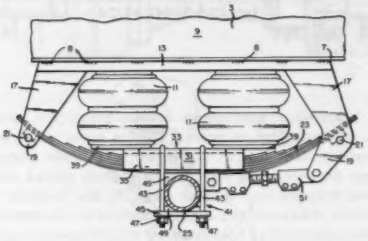
LIGHTWEIGHT HIGH STRENGTH AUXILIARY LIFT AXLE SUSPENSION SYSTEM FOR HIGH FRAMED VEHICLES

Gordon L. Gibson, Scottville, Mich., assignor to TWM Manufacturing Company, Inc., Canton, Ohio

Filed Nov. 8, 1974, Ser. No. 522,186
Int. Cl.² B60G 11/46
U.S. Cl. 280—704 **24 Claims**

1. A high strength auxiliary lift axle suspension system for use in a vehicle having longitudinal flexible frame members which are comprised of a horizontal flange and a vertical web member, said system comprising a pair of upwardly biased leaf springs for normally retaining said lift axle in its lifted position, each leaf spring being retained at about its central portion by a longitudinally extending spring retaining means supporting

at each end thereof vertically flexible air bag means which when expanded, work against the upward bias of said leaf springs to lower said lift axle to its road travel position, each leaf spring being retained at its ends by spring hanger means which are connected together by a frame-connecting member for connecting the system to said longitudinal flexible frame members of the vehicle, said air bag means extending between said frame-connecting member and spring retaining means, said frame-connecting member being a flexible unitizing frame-connecting member extending between said spring hanger means and including a horizontal flange for connecting



said system to the horizontal flange of the flexible frame member of the vehicle and a vertical web member which is offset a spaced distance from and does not contact with the vertical web member of the flexible frame member of the vehicle when the horizontal flange of the frame-connecting member is connected to the horizontal flange of the frame member of the vehicle, the structure of said flexible frame-connecting member extending between said spring hanger means enabling said system to withstand the preload forces of said leaf springs prior to connection of the system to the flexible frame members of the vehicle.

4,000,914

VEHICLE SUSPENSIONS

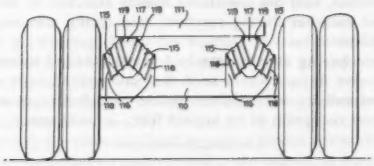
Ronald Wragg, Bellevue House, Waterloo Road, Matlock Bath, Derbyshire, England

Filed Dec. 12, 1974, Ser. No. 532,190

Claims priority, application United Kingdom, Dec. 20, 1973, 59145/73

Int. Cl.² B60G *11/24*

U.S. Cl. 280—716 **6 Claims**



1. A vehicle suspension system including an axle structure comprising at least one axle, and a vehicle-supporting frame structure, wherein the improvement comprises a pair of mountings for pivotally supporting the frame structure on the axle structure at each end of said axle, each mounting consisting of a pair of spring members, located adjacent to one end of said axle, each of which extends between a rigid portion of the axle structure and a rigid portion of the frame structure and comprises a plurality of rigid plates separated in a sandwich-type structure by blocks of resilient material secured to each adjacent plate, the axes of each pair of spring members extending transversely to the direction of travel of the vehicle and being upwardly inclined relative to each other at equal and opposite angles, and each spring member being designed to operate under compression and shear to support the frame structure, but having relatively little torsional resistance so that it operates as a pivotal support.

4,000,915

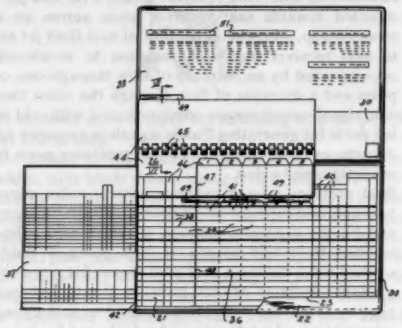
CONSUMER DIARY

Leslie S. Strom, Des Plaines, Ill., assignor to Market Research Corporation of America, Chicago, Ill.

Filed Aug. 4, 1975, Ser. No. 601,270

Int. Cl.² B42D *3/00*; B42F *21/00*

U.S. Cl. 281—31 **1 Claim**



1. A survey diary and reporting folder comprising,

first and second rigidly firm covers hinged together along one edge so that they may both lie flat when unfolded and may be folded into overlying adjacency to protect the contents thereof when closed,

each said cover being generally rectangular and having upper, lower and side edges and inner and outer surfaces,

each said cover comprising a stiff inner backing member enclosed by inside and outside sheet-form members bonded together at the outside edges and fused together between the respective covers to form a hinge section,

a tab formed by a slit parallel to and spaced inwardly of the lower edge of said first cover on said inside sheet-form member,

said tab terminating approximately one-half of the length of the adjacent cover edge,

a pair of spaced apart parallel slits formed in said inside sheet-form member of said second cover inwardly of the hinge section and extending approximately three-quarters of the length of said cover,

a separate slit formed through the inside sheet-form member of said second cover extending approximately the remaining one-quarter length thereof and spaced inwardly of the upper and lower edges to form the opening of a pouch,

a plurality of rectangular information entry sheets inserted and retained in said folder behind said tab and being supported by said first cover,

a data entry index sheet of L-shaped configuration having one leg of the L inserted into the innermost slit of said spaced apart parallel slits in said second cover,

a plurality of postage envelopes inserted into said opening of said pouch,

and a data entry book comprising a rigid backing sheet inserted into the outermost slit of said spaced apart parallel slits in said second cover,

said data entry book comprising a ring binder connected to said rigid backing sheet and disposed to overlie the hinge section, and a plurality of plural page groups,

each page group separated by a separate index page bearing a thumb tab projecting outwardly of the edges of the pages,

thereby to provide flip-over pages to selectively overlie said entry sheets,

each of said rectangular information entry sheets having a first general data zone which folds outwardly away from the folder and an item data zone divided into horizontal lines and vertical columns,

each page of said data entry book having indexed columns aligned with corresponding columns on the item data zone of the topmost information data entry sheet,

each said entry sheet and each said page having a key register to insure accurate pre-alignment,

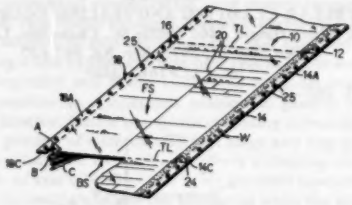
said data entry index constituting an index to the products in the data entry book,

whereby entries made by a user in the field and requested by the data entry book may be entered on the topmost entry sheet for subsequent posting of the entry sheet to a remote data compilation center.

4,000,916
MANIFOLD REPORT FORM AND METHODS FOR USING THE SAME

Roland T. Lucas, Milwaukee, Wis., assignor to St. Luke's Hospital Research Foundation, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 420,645, Nov. 30, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,702
Int. Cl.² B41L *1/20*
U.S. Cl. 282—11.5 A **1 Claim**

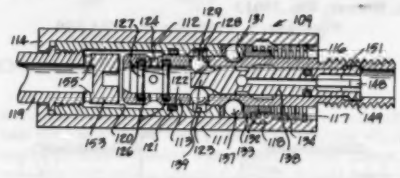


1. A web comprising a plurality of manifold report forms, each manifold report form being joined to an adjacent manifold report form along an adjoining end edge, and a tear line transverse to said web along said adjoining end edge, each manifold report form comprising three superimposed and coextensive record sheets, namely top, middle and bottom record sheets, each record sheet having opposite lateral side edges and opposite end edges, each record sheet being provided with first and second perforate tear lines parallel to and adjacent opposite lateral side edges to define first and second tear strips, respectively, along the lateral side edges of the record sheets, said second tear lines being stronger than said first tear lines whereby said first tear lines separate first, means for mechanically joining together said first and second tear strips, respectively, pin feed holes in each of said tear strips, a first set of carbon papers comprising two first carbon papers arranged so that a first carbon paper is positioned between each adjacent pair of record sheets, one first carbon paper located between said top and middle record sheets having its carbon side facing said middle record sheet and the other first carbon paper having its carbon side facing said bottom record sheet, a second set of carbon papers comprising two second carbon papers arranged so that one second carbon paper is positioned between said one first carbon paper and said top record sheet and so that the other second carbon paper is positioned between said other first carbon paper and said middle record sheet, said one second carbon paper having its carbon side facing said top record sheet and said other second carbon paper having its carbon side facing said middle record sheet, a protective paper positioned between each second carbon paper and the adjacent record sheet, said first and second carbon papers and said protective papers being narrower than said record sheets, means for securing each of said first carbon papers and each protective paper along only one lateral side edge to said first tear strip, means for securing each of said second carbon papers along only one opposite lateral side edge to said second tear strip.

4,000,917
GAS-ACTUATED EMERGENCY PILOT RELEASE SYSTEM

Paul W. Poehlmann, Stinson Beach, Calif., assignor to H. Koch & Sons, Inc., Anaheim, Calif.

Division of Ser. No. 417,140, Nov. 19, 1973, Pat. No. 3,884,436. This application Feb. 26, 1975, Ser. No. 553,096
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **8 Claims**



1. A tension release fluid conduit connector comprising in combination,

a male structural member adapted for fluid conduction,

a female structural member adapted for fluid conduction,

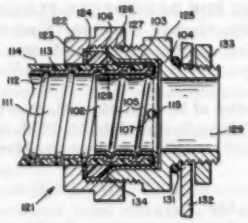
means for locking said male member within said female member responsive to fluid pressurization, said locking means being disposed within said male member, and

means coupling said male structural member within said female structural member absent fluid pressurization for releasing said male member responsive to a tensile stress, whereby, a tensile stress will separate said male and female structural members absent fluid pressurization through said connector and whereby upon fluid pressurization through said connector said male and female structural members lock together to thereby prevent decoupling said male and female structural members responsive to a tensile stress.

4,000,918
FERRULE FOR LIQUID TIGHT FLEXIBLE METAL CONDUIT

Frederick A. Reker, Burlington, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,832
Int. Cl.² F16L *35/00*
U.S. Cl. 285—93 **7 Claims**



1. A metal ferrule for engagement with flexible metal conduit and comprising in combination:

a. a first cylindrical portion having a threaded body adapted to mate with the interior of an open end of the flexible metal conduit and in electrical engagement therewith;

b. a wall joined to said first cylindrical portion and extend-

ing outward from said first cylindrical portion and having at least a part thereof in a plane at right angles to the axis of said first cylindrical portion for contacting the end of said flexible metal conduit and thereby limit the penetration of said first cylindrical portion within the interior of the flexible metal conduit; and

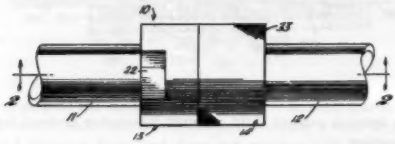
c. said ferrule having a hole in the vicinity of the junction of said wall and said first cylindrical portion to provide for inspection of the proximity of the end of the flexible metal conduit to said wall to verify maximum engagement between said ferrule and said conduit.

4,000,919

PIPE COUPLER

Francis P. Edwards, and Leo F. James, both of 1111 E. 24th St., Hialeah, Fla. 33013

Filed Apr. 9, 1969, Ser. No. 814,609
Int. Cl.² F16L *17/02*
U.S. Cl. 285—111 **9 Claims**



1. A pipe coupler comprising, in combination, a body member having a first central bore for the slip-fit reception of one end of a pipe section to be connected, a nut member having a second central bore for the slip-fit through passage of pipe to be connected, means for releasably securing said nut member to one end of said body member in coaxial alignment therewith, said body member being formed, at said one end, with a (second) third bore of increased diameter with respect to said first central bore and defining an annular recess with respect thereto, a resilient locking ring having a frusto-conical outer peripheral marginal portion and an angularly-offset inner peripheral marginal portion offset in the direction of divergence of said frusto-conical outer marginal portion, said inner peripheral marginal portion being radially slotted to provide a plurality of arcuate ring segments, and means controlled by the securement of said nut member to said body member for clamping said frusto-conical outer portion of said locking-ring in a plane perpendicular to the axes of said bores, the inner edges of said segments, before said locking-ring is so clamped, defining a circle of no lesser diameter than that of said central bores, and when said locking-ring is so clamped, defining a circle of slightly lesser diameter than that of said bores.

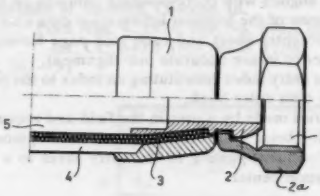
4,000,920

COUPLING FOR REINFORCED FLEXIBLE HOSES

László Horváth; Gusztav Gündisch; Sándor Antal; Mihály Árvai; György Zádor, and Elemer Lantos, all of Budapest, Hungary, assignors to Taurus Gumilpari Vallalat, Budapest, Hungary

Continuation of Ser. No. 456,208, March 29, 1974, abandoned. This application July 22, 1975, Ser. No. 598,126
Claims priority, application Hungary, Mar. 30, 1973, OA 518
Int. Cl.² F16L *39/00*
U.S. Cl. 285—149 **1 Claim**

1. Coupling device comprising a flexible hose of elastomer reinforced with layers of wires, there being a core of said elastomer bonded to the inside of said layers of wires and a cover of said elastomer bonded to the outside of said layers of wires, an outer socket adhesively bonded to the end of said flexible hose and an inner supporting sleeve bonded adhesively to said flexible hose, the inner surface of said inner sleeve being cylindrical, one end of said inner sleeve being disposed within said outer socket, said supporting sleeve and said outer socket being out of metallic contact with one another, the sole connection between said supporting sleeve and outer socket being an adhesive connection through said flexible hose, the end portion of said layers of wires extending axially beyond said core and cover, the outer surface of said



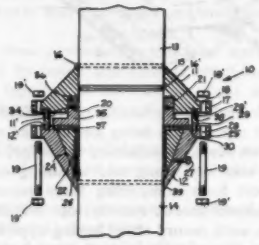
supporting sleeve and the inner surface of said outer socket grasping said end portion of said layers of wires between them and each comprising a truncated cone whose apex is disposed endwise outwardly of said flexible hose, said cover extending axially partway between said wires and said outer socket, said supporting sleeve extending axially partway between said wires and said core.

4,000,921

TUBULAR CLAMPING AND SEALING COUPLER

Ronald Albert Daspit, 2401 Delille St., Chalmette, La. 70043

Filed July 21, 1975, Ser. No. 597,637
Int. Cl.² F16L *23/00*
U.S. Cl. 285—336 **3 Claims**



1. A tubular clamping and sealing coupler for underwater pipelines, in which the ends of two tubular conduits (13) (14) are joined and sealed, comprising a coupling section (11) welded to one of the tubular conduits (13), a second coupling section (12) received on the second tubular conduit (14), gripping projections (26) bearing against the second tubular conduit (14), first, second and third seals (37) (36) (38) between the coupling sections (11) (12) and fasteners (19) (19') drawing the second coupling section (12) and second tubular conduit (14) toward the first coupling section (11) and the first tubular conduit (13) and compressing the seals (37) (36) (38) into sealing position, a stepped ring (35) between the coupling sections (11) (12), one surface of said stepped ring bearing against said second seal (36) in the first coupling section (11) and an opposite surface of the stepped ring bearing against said first seal (37) in the second coupling section (12), said second coupling section (12) having a frustoconical recess therein, a gripping member (22) positioned in said recess, the gripping projections (26) being located on the internal surface of the gripping member (22) adjacent the second tubular conduit (14), and a recess (20) in the first coupling section (11), adjacent the first tubular conduit (13), said second seal (36) received in said recess, and a flat ring (34) received in the recess and bearing against said second

seal (36), and confronting annular seats (29) (29'), in said first and second coupling sections to receive said third seal, said first annular seal (37) being flat and resting against gripping member (22) and a shoulder (30) in the second frustoconical coupling section (12), the stepped ring (35) having a flange bearing against said first seal (37) and a collar received in recess (20) and bearing against the ring (34).

4,000,922

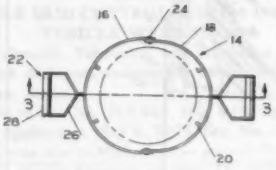
COLLAPSIBLE CARRIER FOR KEGS

John A. Wade, 244 Edgeford Drive, Pratt, Kans. 67124

Continuation of Ser. No. 517,515, Oct. 24, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,141

Int. Cl.² B66C *1/44*

U.S. Cl. 294—16 **1 Claim**



1. A collapsible carrier for metal kegs and other receptacles having a cylindrical configuration, said carrier comprising a collapsible ring clamp having a diameter slightly larger than said keg adapted to grip the exterior of said keg, said clamp comprising a pair of semi-circular rigid ring like split members pivoted together and being collapsible from an expanded circular position to a collapsed position in general registry with one another, handle bar means extending outwardly from a middle portion of each of said split rings and keg gripping means consisting of tooth-like members extending inwardly from each of said split rings and being directed upwardly at a sufficient acute angle above the horizontal when the split ring members are expanded to the fully opened position that when the split ring members are partially closed to the keg clamping position they are still directed at an acute angle slightly above the horizontal so that they dig into the keg to prevent slippage, the handle bar means being comprised of a handle bar member positioned in alignment with a medial portion of the ring-like members extending generally parallel to the axis of the pivot means connecting said ring-like members and being rigidly connected to a medial portion of said ring-like members by a rigid handle bar support, said support in the clamp open position extending outwardly and slightly upwardly and in the partially closed keg clamping position extending upwardly at a greater degree and outwardly to provide space between the handle bar and the keg for the hand of the user.

4,000,923

GABION BASKET EMPLACEMENT APPARATUS AND METHOD

Matt Baldwin, 127 N. Milroy, Olympia, Wash. 98502

Filed June 26, 1975, Ser. No. 590,461

Int. Cl. B66c *1/38*

U.S. Cl. 294—67 AB **15 Claims**

1. A gabion basket emplacement apparatus for placing filled gabion baskets into a revetment mattress comprising:

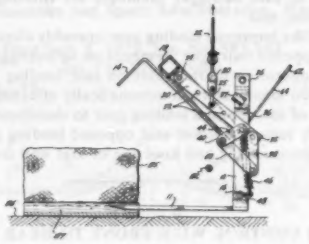
a frame means including a plurality of substantially vertical frame elements rigidly secured together by at least one crossmember;

a plurality of lifting tines rigidly secured to said frame;

a plurality of hold-down arms rotatably attached to said frame for engaging a filled gabion basket placed upon said tines to prevent said basket from slipping off said tines when the apparatus is lifted;

counterbalance means attached to said frame and preventing rotation of said arms whenever said apparatus is empty but permitting rotation thereof whenever a filled gabion basket rests on said tines;

means to lift said apparatus connected to said counterbalance means whereby said apparatus may be lifted with said arms in an open position and said tines substantialy



horizontal whenever said apparatus is not loaded and with said arms in a closed, basket engaging position whenever said apparatus is loaded with a filled gabion basket, and secondary lift means attached directly to said frame rearwardly of said means to lift whereby said apparatus may be withdrawn easily from beneath said gabion basket.

4,000,924

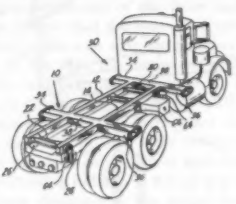
DEMOUNTABLE EQUIPMENT SUPPORT FRAME FOR TRUCK BODIES

Thomas W. Blasingame, P.O. Box 1532, Boise, Idaho 83702

Filed May 5, 1975, Ser. No. 574,460

Int. Cl.² B62D *33/06*

U.S. Cl. 296—35 A **8 Claims**



1. A demountable equipment support unit frame for motor trucks and related vehicles, comprising:

a pair of parallel spaced longitudinal structural members including a plurality of spaced transverse cross pieces secured thereto to define a unit frame having a front end and a rear end,

an elongated outrigger assembly arranged transversely of and secured to said unit frame at said front end so as to define a central section intermediate said longitudinal structural members and a respective outrigger member projecting outwardly and perpendicularly from each longitudinal structural member,

coupling components on said unit frame adapted for cooperation with complementary coupling components on a truck chassis,

a second like outrigger assembly mounted to said unit frame at a predetermined point rearwardly of the front end thereof,

an elongated shaft,

means in said outrigger assembly for rotatably supporting said shaft so that it extends through said central section and into said respective outrigger members,

a landing gear of the type having a support shoe,

a vertical reciprocal lifting means on said landing gear with geared means for effecting such reciprocation,

a structural member extending perpendicularly from said landing gear,

a shaft carried by said structural member and operatively connected at one end to said geared means for rotation thereby,

means on said shaft at the other end thereof for removable attachment to and operable engagement with the shaft in one of said outrigger members for rotating such shaft therein, and

with a like improved landing gear operably disposed relative to opposed outrigger members on an outrigger assembly, the operation of the shaft on one landing gear by the geared means thereon automatically effecting the operation of the opposed landing gear to simultaneously selectively raise and lower said opposed landing gear and the resultant raising and lowering of said unit frame.

4,000,925

CHAIR CONTROL WITH FRONT TO REAR TORSION BAR

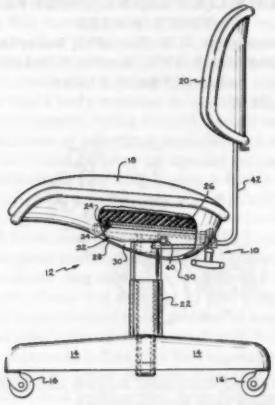
Wendell P. Doerr, Northbrook, Ill., and George F. Janko, Lexington, Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed July 21, 1975, Ser. No. 597,410

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A47C *3/00*

U.S. Cl. 297—304 **6 Claims**



1. In a chair having a seat supporting frame extending front to rear of the chair, a seat back structure having a lower end portion pivotally supported on said frame and an upper end portion extending upwardly at a position rearwardly of said frame, a torsion bar mounted on said frame at a position extending front to rear thereof, said torsion bar having a front end fixedly secured to said frame and a rear end capable of axial twisting movement relative to said front end, and means connecting said torsion bar rear end to said seat back structure at a position between said lower and upper end portions thereof so that backward tilting movement of said upper end portion causing pivotal movement of said seat back structure results in said twisting of the rear end of said torsion bar.

4,000,926

WHEEL WITH INDIVIDUALLY FORMED RIBS

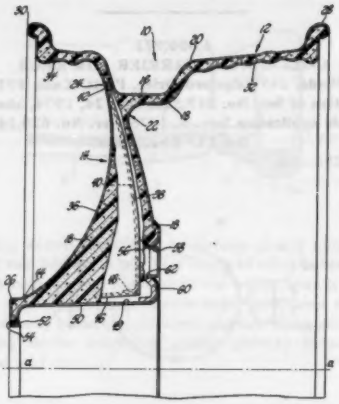
Raymond J. Wlcox, 44 Via Casitas, San Luis Rey Downs, Calif. 92068

Filed Oct. 31, 1975, Ser. No. 627,580

Int. Cl.² B60B *5/02*

U.S. Cl. 301—63 DD **12 Claims**

1. A vehicle wheel comprising: a plurality of structural members secured to each other to define a cavity; said members defining an outer annular rim for mounting a tire and a disc within the confines of the rim; one of the members being an outboard member that defines the outboard side of the disc and includes a plurality of radially extending openings that are spaced circumferentially with respect to each other; a plurality of ribs projecting in an outboard direction through the openings so as to give the wheel a styled appearance and to cooperate with the structural members to enclose the cavity; and foam received within the cavity and adhered to the structural members and to the ribs to cooperate therewith as a load bearing component of the wheel.



4,000,927

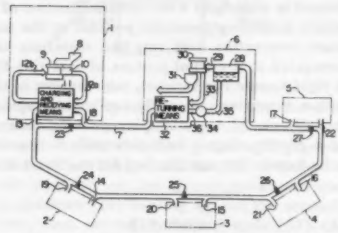
CAPSULE HYDRAULIC-TRANSPORTATION SYSTEM

Masakatsu Sakamoto, Matsudo; Syosaku Watanabe; Takafumi Karino, both of Ibaraki, and Isao Honma, Abiko, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 26, 1975, Ser. No. 590,468

Int. Cl.² B65G *51/00*

U.S. Cl. 302—2 R **10 Claims**



1. A capsule hydraulic-transportation system comprising a plurality of capsule forwarding stations; at least one capsule receiving station; and a transport pipe line interconnecting said plurality of capsule forwarding stations with said capsule receiving station for transporting capsules therebetween;

wherein each of said forwarding stations comprise first means for providing said capsules in timed sequence, and second means interconnected with said first means for continuously feeding said capsules provided by said first means into said transport pipe line, said second means further receiving capsules from said transport pipe line for supply back to said first means;

said first means comprising a plurality of feeding ducts arranged in parallel relation to one another, third means for selectively introducing a predetermined number of capsules respectively into each of said plurality of feeding

ducts in a predetermined timed sequence through a first valve in each of said plurality of feeding ducts, a discharge duct coupled to each of said plurality of feeding ducts through a second valve in each of said feeding ducts for discharging said capsules continuously to said second means, first pipe means for introducing transportation liquid under high pressure into each of said plurality of feeding ducts downstream of said first valve in the direction of travel of said capsules, said first pipe means being connected to each of said feeding ducts through a third valve, and second pipe means for discharging said transportation liquid from each of said feeding ducts through a fourth valve, said second pipe means being connected to each of said feeding ducts upstream of said second valve in the direction of travel of said capsules.

4,000,928

VEHICLE SKID CONTROL SYSTEM INCLUDING VEHICLE SPEED SENSOR

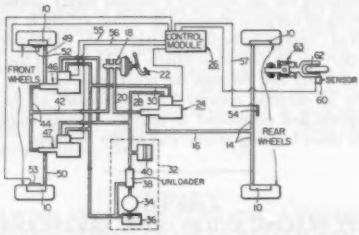
Yasuhisa Takeuchi, Yokosuka, and Haruhiko Iizuka, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 365,465, May 31, 1973, abandoned. This application May 8, 1975, Ser. No. 575,583

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B60T *8/08*

U.S. Cl. 303—103 **8 Claims**



1. A skid control system for a motor vehicle, which comprises:

a wheel speed sensor for generating a wheel speed signal;

a pseudo vehicle speed signal generator for generating a pseudo-vehicle speed signal in accordance with the wheel speed signal;

an actual vehicle speed sensor for generating an actual vehicle speed signal when energized;

first means connected to said pseudo vehicle speed signal generator and actual vehicle speed sensor for passing therethrough the larger in amplitude of said pseudo vehicle speed signal and actual vehicle speed signal;

a differentiator for differentiating said wheel speed signal to produce a wheel acceleration signal;

second means connected to said first means, said wheel speed sensor and said differentiator for producing an impending skid signal in accordance with said the larger from said first means, of said wheel speed signal and the wheel acceleration signal;

a second comparator connected to said differentiator for producing a brake release signal when said wheel acceleration signal lowers below a first predetermined level;

a third comparator connected to said differentiator for producing a brake application signal when said wheel acceleration signal exceeds a second predetermined level;

an actuation signal generator for producing an actuation signal in accordance with said impending skid signal, brake release signal and brake application signal;

a brake pressure modulator for modulating the brake pressure in response to said actuation signal; and

energizing means for energizing said actual vehicle speed sensor in response to said actuation signal or said impending skid signal.

4,000,929

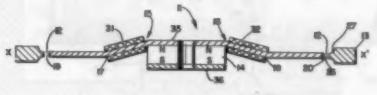
MAGNETIC BEARING SYSTEM

Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed July 3, 1975, Ser. No. 593,142

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **33 Claims**



1. A magnetic bearing comprising an inner member symmetrical about a longitudinal axis and having exterior magnetic pole faces on opposite sides of the axis, an outer member coaxial with the inner member having interior magnetic pole faces on opposite sides of the axis, said inner and outer members being mechanically free of each other, one of said members being fixed relative to the longitudinal axis so that it lies in a plane at right angles to the axis and has a predetermined longitudinal position along the axis, said members being adapted to lie in a common plane and to have radial air gaps between the pole faces on the opposite sides of the axis, boundaries of said air gaps including the interior and exterior pole faces, magnetic circuit means for establishing a different, radially extending magnetic flux in the air gaps on the opposite sides of the axis, the fluxes of said magnetic circuit means being radially directed across the gaps to stablize the longitudinal and angular positions of the inner and outer members relative to the axis so that the inner and outer pole faces are aligned relative to the axis and the members have a zero tilt angle relative to the axis, the means for establishing a closed magnetic path, said path including the air gaps on opposite sides of the axis in series, said magnetic path including means for deriving an additional magnetic flux that flows radially across the air gaps on opposite sides of the axis to control the relative radial positions on the inner and outer members, the additional flux flowing radially in the air gap on one side of the axis in the same direction as the radial flow of flux in the magnetic circuit for the air gap, the additional flux flowing in the air gap on the other side of the axis in the opposite direction as the radial flow of flux in the magnetic circuit on the opposite side of the gap, said inner member having a relatively long length in a plane at a right angles to the axis relative to its length along the axis.

4,000,930

GASTIGHT LIQUID-TYPE DYNAMIC SEAL FOR CONTROL SHAFTS OF PRESSURIZED CIRCUIT INTERRUPTERS

Alain Poncet, Grenoble-Villeneuve, and Serge Roccaz, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Mar. 27, 1975, Ser. No. 562,413

Claims priority, application France, Apr. 10, 1974, 74.12701

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² F16C *1/24, 33/72*

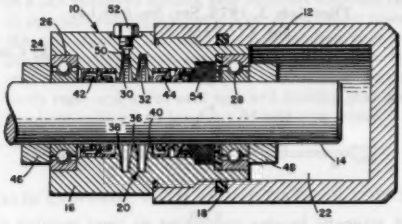
U.S. Cl. 308—36.3 **4 Claims**

1. Gastight dynamic seal sealing the pressurized enclosure of a compressed-gas circuit interrupter to a movable control stud extending through said enclosure, comprising:

a stationary sleeve member connected in a gastight manner to said enclosure and surrounding said stud,

bearing means supporting said stud from said sleeve for free movement of said stud relative to said sleeve,

a plurality of gas-trap chambers defined between said sleeve and said stud, said chambers being spaced apart in the longitudinal direction of said stud and separated by partition wall means clearing said stud so as to leave small throttle passageways between successive chambers along said stud, and



flexible baffle joint means disposed in at least a part of said chambers and bearing against said sleeve in friction and sealing relation with said stud,

said chambers containing a viscous gas-trap liquid dissolving the gas leaking from the interior of said enclosure through said baffle joint means whereby said passageways produce a degressive concentration of the dissolved gas in successive chambers.

4,000,931

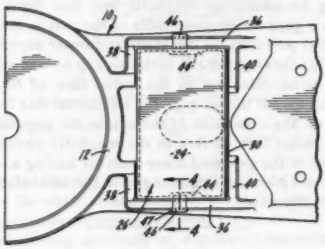
RAILWAY CAR CENTER PLATE AND AUXILIARY RESILIENT BEARINGS

Robert P. Geyer, Palatine, Ill., assignor to Standard Car Truck Co., Chicago, Ill.

Filed July 25, 1975, Ser. No. 598,936

Int. Cl.² B61F *5/08, 5/14, 5/16;* **F16C** *17/04*

U.S. Cl. 308—138 **1 Claim**



1. A railroad car bolster including spaced pad retainers positioned on either side of the bolster center plate area, each of said pad retainers having spaced upwardly-extending opposite side walls, said side walls having a substantially continuous generally level uninterrupted upper surface, a slanted bottom wall for each retainer,

a wedge-shaped elastomeric pad positioned within each retainer, each pad having a generally level top wall and a slanted bottom wall seated on said pad retainer slanted bottom wall, opposite sides of each pad having a wedge-shaped elongated slot extending generally along and spaced from a corresponding retainer side wall, said slots being generally intermediate the opposite ends of each pad, and a fastening member for maintaining each pad within a retainer welded to each side wall generally intermediate its ends and extending into a slot, said fastening members being generally L-shaped, with one side of the fastening member being welded to a retainer side wall and the other side extending along the top of the retainer side wall and into a pad slot, said slots having a length at least twice the width of a fastening member to permit variable positioning of the fastening member upon each side wall, but with full welding area of said fastening member one side to each side wall regardless of the vertical position of the pad within the retainer.

4,000,932

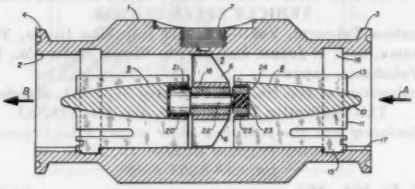
TURBINE METER ROTOR BEARING

Lewis Karl Harris; Billy Steve Burrus, and Donald Wayne Allison, all of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 15, 1975, Ser. No. 613,692

Int. Cl.² F16C *9/00*

U.S. Cl. 308—237 R **3 Claims**



1. A bearing for the rotor of a turbine meter, including,

a bushing of ceramic material mounted axially in the rotor,

a shaft of ceramic material mounted in one of the two spider supports so as to extend axially of the bore of the turbine meter body and through the rotor bushing, and

a body of ceramic mounted in the second of the spider supports and positioned to provide bearing engagement with rotor bushing at one end of the bushing.

4,000,933

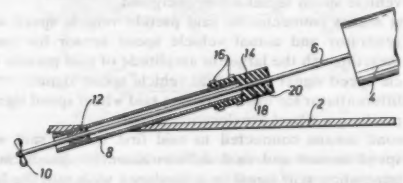
SHAFT SEALING AND BEARING ARRANGEMENT, ESPECIALLY FOR PROPELLER SHAFTS

Karl Gustaf Derman, Sorgardsvagen 7, S-433 00 Partille, and Nils-Erik Bohman, Granvagen 1, S-330 12 Forsheda, both of Sweden

Filed July 8, 1975, Ser. No. 593,964

Int. Cl.² B63H *5/06*

U.S. Cl. 308—237 R **5 Claims**

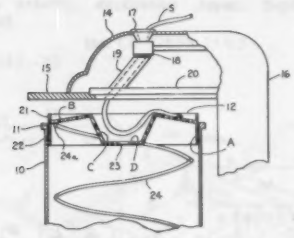


1. A sealing and bearing arrangement for an axially extending propeller shaft for a boat where one end of the arrangement is to be immersed in water comprising a sleeve of elastic material elongated in the direction of shaft extension and sealingly engaging the boat in a region near one end only of the sleeve, the sleeve enclosing the shaft and including a shaft bearing portion axially spaced from the region of the sleeve engaging the boat and accessible to the water, the sleeve further including a sealing portion at the side of the bearing portion axially opposite from the liquid and from the sleeve one end which engages the boat, the sealing portion being adapted to be guided in the radial direction by the bearing portion.

4,000,934
ROVING CAN PISTON

Robert L. Carroll, 408 McIver, Greenville, S.C. 29601

Continuation-in-part of Ser. No. 536,968, Dec. 23, 1974, abandoned. This application June 2, 1975, Ser. No. 582,607
Int. Cl.² A47F 1/00; B65D 25/10
U.S. Cl. 312—71 9 Claims



1. A piston for use with a cylindrical open topped roving can containing a coil spring between a can bottom and said piston urging said piston upwardly within said can toward a tube gear and the like from which a sliver and the like is dispensed into the can comprising:

a vertical cylindrical marginal skirt within and closely adjacent a cylindrical side of said can for guiding said piston within the can;

an annular inwardly extending surface carried adjacent an upper portion of said skirt for receiving said sliver;

an annular downwardly inclined conical surface extending inwardly from said first mentioned surface; and

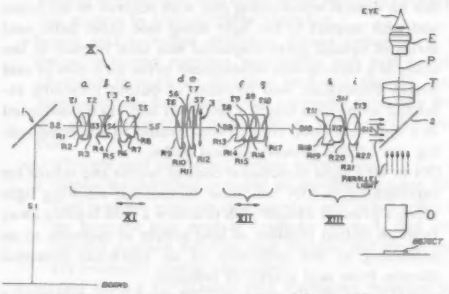
a central bottom portion bridging said downwardly inclined surface disposed adjacent a lower edge of said skirt;

whereby the capacity of the roving can is increased while avoiding a hard central core of sliver as often ultimately results in faulty yarn.

4,000,935
DRAWING ATTACHMENT HAVING A FOCUSING SYSTEM, POWER CHANGER SYSTEM AND A TELESCOPE FOR A MICROSCOPE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 14, 1975, Ser. No. 631,809
Int. Cl.² G02B 7/04, 15/00
U.S. Cl. 350—41 4 Claims

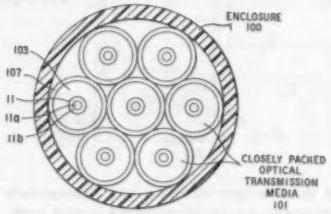


1. A drawing attachment comprising, all sequentially aligned along an optical path, a focusing system XI including (a) a double convex positive doublet, (b) a double concavo negative singlet, (c) a double convex positive doublet (d) a convex-plano positive singlet and (e) a convex-plano positive singlet, a power changer XII including (f) a double convex negative doublet and (g) a concavo-convex negative singlet, said power changer being axially slideable along said optical path, and a telescope XIII including (h) a concavo-convex positive doublet and (i) a double convex positive singlet.

4,000,936
OPTICAL FIBER JACKET DESIGNS FOR MINIMUM DISTORTION LOSS

Detlef Christoph Gloge, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 30, 1974, Ser. No. 493,029
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 WG 9 Claims



1. An optical fiber cable comprising a plurality of closely packed optical transmission media, each of said media comprising only one optical fiber waveguide and a protective jacket encasing the fiber and disposed in contact therewith and having an outer diameter less than about 0.4 millimeter and a modulus in the lateral direction which is less than about 50,000 psi, in which said jacket is such that the combined structure of said fiber and said jacket has a characteristic retention length R which exceeds a critical coupling wavelength Λ_c for said fiber, where the retention length R is given by

$$R = 2\pi \left(\frac{H}{D_f}\right)^{1/4}$$

and where H is the flexural rigidity, and D_f is the lateral rigidity, respectively, of said combined structure, and in which at least one of said optical transmission media further comprises an outer shell encasing said jacket, said shell having a modulus at least an order of magnitude larger than said jacket modulus, said shell having a thickness less than about one tenth of said jacket outer diameter and substantially equal to an optimum value related to said jacket modulus, said jacket outer diameter, and said shell modulus according to the relationship indicated by FIG. 8, whereby mode coupling losses are minimized.

4,000,937
PLANAR WAVEGUIDE ELECTROOPTIC PRISM DEFLECTOR

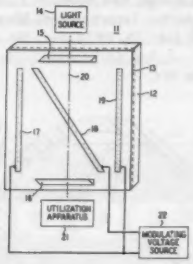
Ivan Paul Kaminow, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 5, 1975, Ser. No. 583,895
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 WG 10 Claims

1. An optical device comprising a substrate, a light-guiding thin-film disposed on said substrate and composed of an electrooptic material oriented to have its axis for the linear electrooptical effect along a first direction parallel to the interface with said substrate, and means for providing electrooptic deflection of light propagating in said film orthogonal to said first direction,

comprising three metallic electrodes in the form of stripes of the metallic material, two of said stripes being disposed essentially parallel to the path of the incoming light and

the third extending essentially diagonally between, but not contacting, opposed ends of the other two stripes,



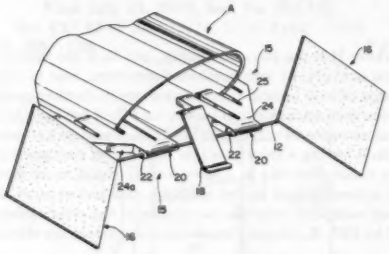
said three stripes defining two substantially triangular electrooptic waveguide portions in said path.

4,000,938

ROTARY SAFETY REFLECTOR

Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611

Filed Mar. 3, 1975, Ser. No. 554,627
Int. Cl.² G02B 5/12
U.S. Cl. 350—99 8 Claims



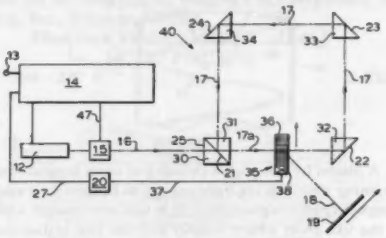
1. A rotary safety reflector assembly for mounting on the exhaust pipe of a vehicle powered by an internal combustion engine, the combustion gases exiting from the exhaust pipe in an exhaust flow, said reflector assembly comprising a rotatable shaft, means for rotatably mounting said shaft in spaced relation with respect to the outlet of the exhaust pipe such that the axis of the shaft is substantially transverse to the direction of the exhaust flow, means defining first and second reflecting surfaces fixedly mounted at each end of said shaft for rotation therewith at locations substantially outboard of said exhaust flow on opposite sides thereof, and a fluid motor fixedly mounted on said shaft intermediate said first and second reflecting surfaces and in alignment with the outlet of the exhaust pipe such that said exhaust flow acts upon said fluid motor to cause rotation of said shaft about its axis, said mounting means comprising means for removably mounting said reflector assembly on the exhaust pipe comprising means for detachably engaging the exhaust pipe on opposite edges thereof, said mounting means including at least two resilient mounting arms which biasingly engage said opposite edges of said exhaust pipe so as to mount said assembly on said exhaust pipe.

4,000,939

LIGHT OPTIC DATA HANDLING SYSTEMS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed Jan. 12, 1976, Ser. No. 648,537
Int. Cl.² G02F 1/16
U.S. Cl. 350—160 R 3 Claims



1. A light optic data handling system comprising:

a. a source of light;

b. a light admitting surface;

c. a source of control voltages;

d. ON or OFF light availability control means and means for establishing an ON condition thereof for allowing the passage of light from said source of light along at least one input path toward said admitting surface in response to an extending of the influence of an electrical potential thereto from said source of voltages, and means for thereupon directing said light along a series of 360° primary optical paths within said system so as to establish an availability of light from any one of a plurality of output locations of said system;

e. said system presenting a length dimension and having an array of light reflecting surfaces therein extended along said length dimension for providing said series of optical paths, each said surface angularly oriented so as to establish an optical relationship one with respect to the other and with respect to the light along said input path, said series of optical paths displaced one with respect to the other in a side-by-side relationship in the direction of said length dimension, said plurality of output locations extended along said length dimension and each positioned in a light reflection control relationship to a corresponding one of said primary optical paths;

f. ON or OFF light directional control means and means for establishing an ON condition thereof for allowing light along a primary optical path to follow a path leading away from an output location of said system in response to an extending of the influence of an electrical potential thereto from said source of voltages;

g. signal input circuit means for effecting a predetermined time delay between said allowing of the passage of light along said input path in response to an ON condition of said light availability control means, and said allowing of light to follow a path leading away from an output location of said system in response to an ON condition of said directional control means, for controlling a redirecting of light from a predetermined one of said series of primary optical paths and thereupon along a path leading away from a corresponding output location of said system.

4,000,940

CAMERA ALLOWING SIMULTANEOUS SOUND RECORDING

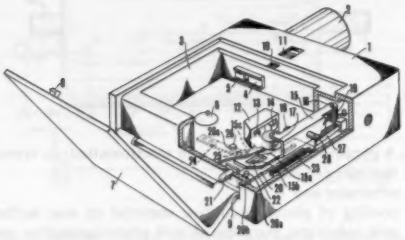
Yoshio Komine, Tokyo; Kazuya Hosoe, Machida; Mamoru Shimazaki; Toshikazu Ichiyanagi, both of Tokyo, and Kiyoshi Takahashi, Kunitachi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 23, 1974, Ser. No. 508,327

Claims priority, application Japan, Sept. 26, 1973, 48-108249

Int. Cl.² G03B *23/02*

U.S. Cl. 352—72 4 Claims



1. A motion picture camera capable of using a film cartridge containing a sound film strip for recording both image information and sound information wherein the improvement comprises:

a cartridge chamber for accommodating said film cartridge;

an openable cover for selectively covering the opening of said cartridge chamber;

a capstan driven at a substantially constant speed and provided along the path of said film;

a pinch roller provided on the opposite side of said path so as to substantially face said capstan;

a displacing means for bringing said capstan and pinch roller into mutual resilient contact in cooperation with the closing operation of said cover thereby enabling said film lodged between said capstan and pinch roller to be driven at a substantially constant speed adapted for recording sound information thereon;

a cartridge detecting means for detecting the presence or absence of said film cartridge in said cartridge chamber and provided with a blocking device forcedly blocking the operation of said displacing means connected with the closing operation of said cover when said film cartridge is not present in said cartridge chamber;

wherein said cartridge detecting means comprises a cartridge detecting member protruding into said cartridge chamber through an opening provided therein, and a biasing means for biasing said cartridge detecting member so as to protrude constantly in said cartridge chamber;

and wherein said displacing means comprises:

a displacing member capable of moving between (a) a first position wherein said capstan and pinch roller can be brought into mutual resilient contact, and (b) a second position wherein said capstan and pinch roller are mutually clearly separated;

a biasing means for biasing said displacing member constantly towards said first position;

a sliding means which maintains said displacing member in its said second position against the biasing force of said biasing means when said cover is opened and allows said displacing member to move to said first position when said cover is closed; and

a cover position detecting means for controlling said sliding means by detecting the open-closed position of said cover.

4,000,941

AUTOMATIC EXPOSURE ADJUSTING DEVICE

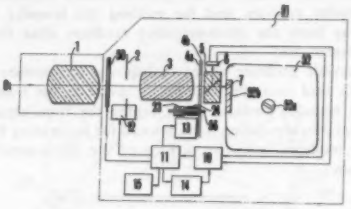
Hidekazu Okajima, Kawasaki; Tomoshi Takigawa, Machida; Noritsugu Hirata, Yokohama; Masamichi Toyama, Machida, and Toshikazu Ichiyanagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1975, Ser. No. 552,368

Claims priority, application Japan, Mar. 1, 1974, 49-23947

Int. Cl.² G03B *7/08*

U.S. Cl. 352—141 28 Claims



1. In an automatic exposure adjusting device, an improvement comprising:

1. photometric means which receives light corresponding to the quantity of light incident upon an exposure surface and produces an electric output signal corresponding to the quantity of the received light; and

2. controlling means whereby the quantity of light incident upon said exposure surface is controlled to be a preset quantity of light, said controlling means having the following component parts disposed in the path of the incident light coming from a photographing object:

a. a first light amount regulating means which is activated when the output of said photometric means is not within a preset range of levels so as to control the quantity of light coming from the photographing object through said path of light and which is connected to the output terminal of said photometric means; and

b. a second light amount regulating means which is also connected to the output terminal of said photometric means and effectively operates when the output of the photometric means is within said preset range of levels so as to permit control over a broader range of exposure adjustment.

4,000,942

TRANSFER MEDIUM SEPARATING DEVICE

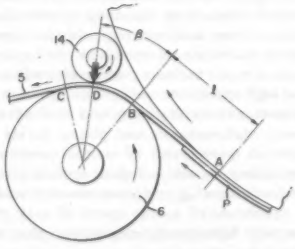
Yoshio Ito; Katuhiko Yamada; Tadayuki Kitajima, all of Yokohama; Koichi Miyamoto, Tokyo; Hiroo Kobayashi, Tokyo, and Yoshikuni Tohyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,803

Claims priority, application Japan, Dec. 27, 1974, 50-4018

Int. Cl.² G03G *15/22*

U.S. Cl. 355—3 R 5 Claims



1. A transfer medium separating device in an electrophoto-

graphic copying apparatus of the type in which a toner image is transferred from the surface of a photosensitive medium to a transfer medium, said device comprising:

a rotatable separating member disposed at a position downstream of an image transfer station;

a transfer medium end guide member disposed in contact with the peripheral surface of said rotatable separating member for separating one end of the transfer medium from the surface of the photosensitive medium at the image transfer station where a toner image is transferred from the surface of the photosensitive medium to the transfer medium and for guiding the transfer medium away from the photosensitive medium after the image transfer; and

a rotatable pressure member disposed in pressure contact with said rotatable separating member for transporting the transfer medium while urging the same against said rotatable separating member and for separating the transfer medium from the surface of the photosensitive medium.

4,000,943

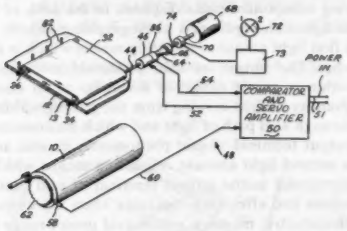
TWO SPEED, DUEL PURPOSE DOCUMENT HANDLING SYSTEM

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 13, 1975, Ser. No. 549,684

Int. Cl.² G03G *15/30*

U.S. Cl. 355—8 **16 Claims**



1. A reproducing apparatus for forming an image of a document on a copy sheet comprising:

a transparent platen for supporting said document to be copied;

a photoreceptor surface arranged for movement at a constant speed; and

multi-mode optical means for projecting an image of said document at said platen onto said photoreceptor surface, said optical means in one mode of operation including means for scanning a document while it is held stationary on said platen and in another mode of operation including means for scanning a document which is moved across said platen at a speed synchronized to the speed of said photoreceptor surface;

the improvement wherein said apparatus further includes:

a multi-mode document handling system for advancing documents over said platen, said document handling system in one mode of operation corresponding to said one optical mode including: means for advancing a document at high speed onto said platen; means for registering said document on said platen; and means for holding said document stationary on said platen during scanning by said optical means; and in another mode of operation corresponding to said another optical mode including means for advancing a document over said platen at a speed synchronized to the speed of said photoreceptor surface, said high speed being greater than said synchronized speed; and

means for selecting between said one and said another modes of operation of said document handling system.

4,000,944

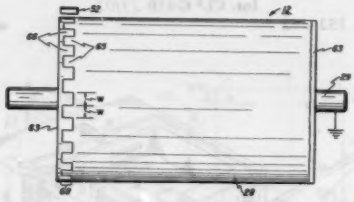
PHOTORECEPTOR FOR ELECTROSTATIC REPRODUCTION MACHINES WITH BUILT-IN ELECTRODE

Lawrence J. Fraser, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 18, 1975, Ser. No. 550,301

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **10 Claims**



1. A photoreceptor for use with electrostatic type reproduction machines, comprising:

a substrate; and

a coating of photoconductive material on one surface of said substrate, portions of said photoconductive coated surface of said substrate being interrupted at regular intervals by conductive areas, said conductive areas extending in strip-like progression along said substrate one surface in the direction of movement of said photoreceptor whereby to provide a built-in strip-like control electrode with said photoreceptor.

4,000,945

INFORMATION RECORDING APPARATUS

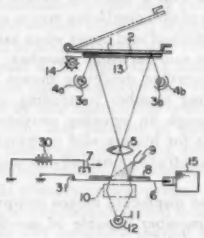
Kunio Tajima; Touhei Kawakami, and Seiichi Hayashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 3, 1975, Ser. No. 538,335

Claims priority, application Japan, Jan. 9, 1974, 49-5280; Feb. 19, 1974, 49-18581

Int. Cl.² G03B *13/28*

U.S. Cl. 355—45 **6 Claims**

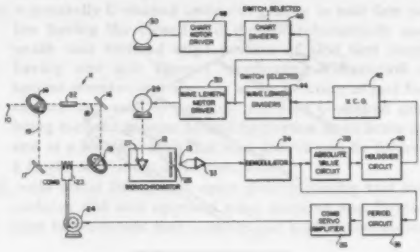


1. An information recording apparatus comprising hold means for holding a photosensitive film at a predetermined position, exposure means for exposing the photosensitive film to light from an information carrying original to be recorded, development means for developing the exposed photosensitive film, monitor light source means disposed opposite to the exposure means with the developed photosensitive film interposed therebetween for directing monitor light through said developed photosensitive film, an optical system for projecting the monitor light passed through said developed photosensitive film to a monitor screen, and a mechanism coupled to said hold means for reversing the developed photosensitive film to obtain a normal image at said monitor screen.

4,000,946
STEPPER MOTOR TRACKING ACCURACY CONTROL FOR SPECTROPHOTOMETERS

Allan S. Way, Irvine, and Stanley L. Pratt, Riverside, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 433,396, Jan. 14, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,512
Int. Cl.² G01J *3/06, 3/42*
U.S. Cl. 356—89 **4 Claims**



1. In a radiant energy analyzer having a radiant energy source, reference and sample radiant energy beam paths, a monochromator and a wavelength scanning mechanism therefor, means generating an error signal which varies as a function of the difference in the intensity in the reference and sample beam paths, attenuator means responsive to the error signal to balance the energy in the beams, the improvement comprising:

a first stepper motor for driving the wavelength scanning mechanism to continuously vary the wavelength output of the monochromator;

an oscillator having a pulse train output of predetermined frequency coupled to drive the first stepper motor, and hence the wavelength scanning mechanism, at a predetermined scan speed;

means responsive to changes in the error signal for varying the frequency of the pulses applied to the stepper motor, whereby the scan speed of the wavelength scanning mechanism is decreased or increased for a corresponding increase or decrease in the error signal to improve the tracking accuracy between the wavelength scanning mechanism and the attenuator means;

chart recording means for recording a radiant energy parameter of the sample and a second stepper motor for driving the chart recording means along an axis thereof, the pulse train output of the oscillator being coupled to drive both the first and second stepper motors in a fixed speed relationshp at speeds proportional to the output frequency of the oscillator; and

first and second variable frequency dividers and means coupling the oscillator pulse train output through said first variable frequency divider to the first stepper motor and through a series connection of said first and second variable frequency dividers to the second stepper motor.

4,000,947
OPTICAL READOUT FOR DIFFERENTIAL LASER GYROS

David C. Grant, Jr., Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 27, 1975, Ser. No. 580,660
Int. Cl.² G01B *9/02;* **H01S** *3/00*
U.S. Cl. 356—106 LR **9 Claims**

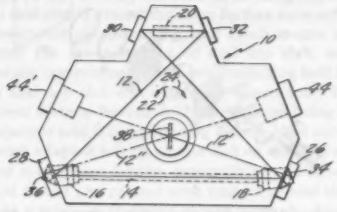
1. An optical readout system for a differential laser gyro comprising

a solid block having a plurality of coplanar passages therein,

a laser gain medium located in at least one of said passages for generating traveling optical waves,

a plurality of mirrors fixedly mounted on the periphery of said block in the plane containing said laser gain medium and said passages for causing said traveling optical waves to traverse said block in a closed path in both clockwise and anticlockwise directions through said passages,

a modulator element having plane parallel end faces located in an additional one of said passages in the path of said traveling optical waves, said modulator element being oriented so that a portion of said clockwise and said anticlockwise traveling waves are respectively reflected



from opposite end faces thereof at a small angle relative to the plane of said traveling optical waves,

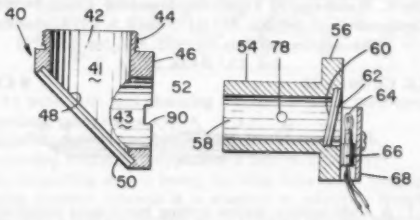
first and second prism means mounted on the periphery of said block for intersecting the reflected portions of said clockwise and anticlockwise waves respectively and redirecting said reflected beam portions in a common plane,

and beam splitter means fixedly mounted on said block in said common plane and adapted to produce from said reflected beam portions first and second colinear output beams.

4,000,948
TARGET METHOD AND SYSTEMS FOR BONDING MACHINES

C. Frederick Miller, 2165 N. Glassell St., Orange, Calif. 92667

Filed July 14, 1975, Ser. No. 595,790
Int. Cl.² G01B *11/26*
U.S. Cl. 356—172 **8 Claims**



1. In a conductor bonder of the kind in which a work piece, viewed through a microscope, is moved relative to the working position of a tool, the improvement which comprises:

a partially reflecting mirror;

means for holding said mirror externally of the microscope optics in the field of objective view of the microscrope;

a target;

image developing means for developing an image of the target and for projecting that image on the mirror such that it is visible when viewing through the microscope; and

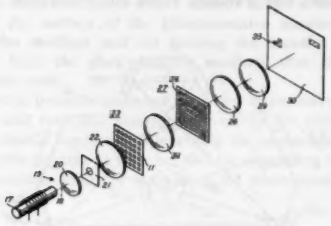
distance altering means for altering the distance of the target from the mirror such that said image can be made to appear at a selected level relative to the level of field that is in focus when viewed through the microscope.

4,000,949

PHOTOMASK INSPECTION BY OPTICAL SPATIAL FILTERING

Laurence S. Watkins, Hopewell, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 15, 1969, Ser. No. 858,002
Int. Cl.² G01B 9/08; G02B 27/00
U.S. Cl. 356—165 7 Claims



1. A method of isolating nonperiodic errors in a photomask containing a pattern formed by a regular array of normally identical elements mutually spaced apart by a predetermined distance, which comprises the steps of:

directing a spatially coherent beam of light at the pattern to diffract the light;

focusing the diffracted light on a filter containing a plurality of discrete opaque regions on a transparent field, the opaque regions being spaced by a distance inversely proportional to the predetermined distance to spatially modulate the intensity of the focused light; and

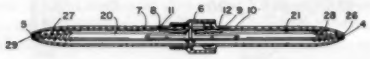
reimaging the spatially modulated light to form an image exhibiting the nonperiodic errors in the pattern.

4,000,950

WRITING INSTRUMENT

Eric C. Wahlberg, 32 Eighth St., Stamford, Conn. 06905

Continuation of Ser. No. 457,411, April 3, 1974, abandoned. This application July 9, 1975, Ser. No. 594,297
Int. Cl.² B43K 27/04
U.S. Cl. 401—32 8 Claims



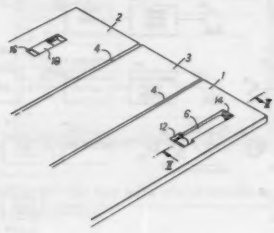
1. A multi-writing means writing instrument comprising a hollow body having a plurality of writing means therein, a separate positioning means located entirely within said hollow body co-acting with each of said plurality of writing means to hold said writing means in either writing or non-writing position in said writing instrument, a separate positioner actuator means located externally on said hollow body and having a part projecting into the interior of said hollow body, said projecting part being freely movable and physically unconnected to each of said positioning means and co-acting separately with each of said positioning means to individually move each of said positioning means into a position where said writing means is held in writing position in said writing instrument separately and independently from the other of said positioning means, and both of said writng means being capable of being positioned at the same time in writing positions at opposite ends of said writing instrument.

4,000,951

LOOSE LEAF BINDERS

Kenneth Malcolm Agnew, 10 Chesterfield Road, London W4; Charles Henry Pentland Denroche, 90 Park Road, Hampton Wick, Kingston-upon-Thames, Surrey, and Roy Hewlett, 46 Lytton Grove, London SW15, all of England

Filed May 6, 1974, Ser. No. 467,363
Claims priority, application United Kingdom, May 8, 1973, 21950/73
Int. Cl.² B42F 3/00, 13/02
U.S. Cl. 402—22 5 Claims



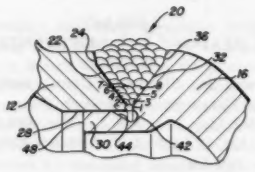
1. A loose-leaf binder formed in one piece of resiliently deformable plastics material and comprising in integral form a back portion and first and second side portions hinged on opposite edges of said back portion, said first side portion having an elongate opening therein extending generally parallel to said edges, a rigid post lying in said opening and connected by a hinge portion to one end of said opening, said post having a first reaction surface thereon spaced from said hinge portion, said first side portion having a projection extending from a side of said opening, said projection providing a second reaction surface spaced from said hinged portion by approximately the same distance as said first reaction surface, whereby when said post is pivoted upwardly from said opening said reaction surfaces cooperate to retain said post in an upright position, said second side portion having a second opening in a face thereof, means at the edge of said second opening providing an abutment surface facing away from said face, the end of said post remote from said hinge portion having a shoulder formed thereon, said end of said post being insertable in said second opening with said shoulder contacting said abutment surface, and a locking member on said second side portion and movable into and out of said second opening respectively to retain said shoulder in contact with said abutment surface and to release said shoulder therefrom.

4,000,952

WELD JOINT HAVING A WELD DROPPINGS RECEIVING POCKET

Harold Bryan, and James W. Johnson, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,851
Int. Cl.² B25G 3/34
U.S. Cl. 403—271 9 Claims



1. A full penetration weld joint for connecting two members, comprising:

a. first and second members each having opposed edge

portions in juxtaposed relation, said first member having a lip portion extending from one side of said edge portion on said first member and lapping over a portion of said second member,

b. said opposed edge portions having opposed facing end surfaces on inner portions of said opposed edge portions being inclined outwardly in outer portions thereof forming an open groove, with said facing surfaces defining the root of the weld joint, said facing surface on said first member extending outwardly from the plane of the outer surface of said lip,

c. a generally U-shaped undercut groove in said first member having the closed end thereof substantially underneath said inclined edge portion of said first member having one side thereof terminating underneath said second member and opening at the juncture of said facing surface and said lip portion, and said U-shaped groove being inclined relative to said lip portion at an acute angle and at a location such that said groove can be formed in a single machining operation, and

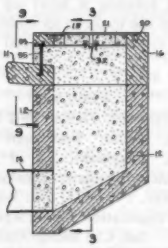
d. weld metal filling said open groove joining said facing surfaces and said opposed edge portions and forming a joint between said first member and said second member.

4,000,953

CONCRETE CATCH BASIN WITH SPRING RETAINED MANHOLE COVER

Walter J. Langeliers, and Roger W. Langeliers, both of Springfield, Oreg., assignors to Concrete Curb Inlets Co., Springfield, Oreg.

Filed Mar. 22, 1976, Ser. No. 669,306
Int. Cl.² E02D *29/12, 29/14*
U.S. Cl. 404—5 **5 Claims**



1. In a pre-cast concrete catch basin for mounting in communication with a storm sewer and having a pair of vertical substantially parallel side walls, a rear wall connecting said side walls, a top slab integrally cast with said side walls and said rear wall, said side walls and said top slab defining therebetween a first opening through which surface drainage is received, said side walls and said rear wall defining a chamber communicating with said storm sewer, said top slab having a second opening therein, a recessed seat disposed in said top slab around said second opening, said second opening being substantially symmetrically disposed with respect to said chamber, and a manhole cover removably disposed in said seat such that the upper surface of said manhole cover is substantially flush with the upper surface of said top slab, the improvement comprising

latch means mounted on the lower surface of said manhole cover for removably retaining said manhole cover in said seat, said latch means comprising

a sleeve attached at its upper end to said lower surface of said manhole cover adjacent one edge thereof,

a washer attached to the lower end of said sleeve,

a rod axially disposed within said sleeve, said rod extending outwardly of said upper and lower ends of said sleeve and through said washer attached thereto, said rod being axially rotatable with respect to said sleeve and said washer by means engageable with the upper end thereof,

a bolt attached to the lower end of said rod outwardly of said washer, said bolt extending perpendicularly to the axis of said rod,

a retainer attached to said rod intermediate its ends, said retainer being received within said sleeve and being rotatable with respect thereto, and

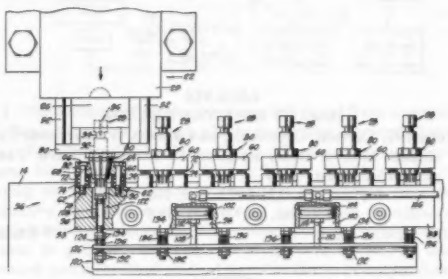
spring means disposed interiorly of said sleeve between said retainer and said washer, said spring means being compressible between said retainer and said washer upon a downwardly directed force being applied axially to said rod to extend the same further outwardly of said lower end of said sleeve; and catch means extending from the lower surface of said top slab, said catch means comprising at least one projecting bolt anchored in said top slab and extending downwardly from said lower surface thereof, said catch means being mounted adjacent said second opening therein, said catch means being adapted to engage said bolt on said rod when said rod is extended further outwardly of said lower end of said sleeve and rotated with respect to said sleeve and said washer, said spring means normally biasing said bolt on said rod toward said sleeve and said washer to retain said bolt in said catch means upon said bolt being rotated into engagement therewith.

4,000,954

AUTOMATIC TOOL CHANGING APPARATUS FOR DRILLING MACHINES AND THE LIKE

Jayantilal S. Patel, El Monte, Calif., assignor to Digital Systems, Inc., Arcadia, Calif.

Filed Oct. 31, 1975, Ser. No. 627,617
Int. Cl.² B23B *47/00*
U.S. Cl. 408—3 **18 Claims**



1. An automatic tool changing mechanism for a machining mechanism, comprising:

a member for releasably retaining a tool mechanism;

supporting means for supporting a tool mechanism;

said supporting means being movable between a nongripping position wherein it is adapted to relatively loosely support a tool mechanism and a gripping position wherein it is adapted to firmly grasp a tool mechanism; and

means operative in response to delivery of a tool mechanism to said supporting means for moving said supporting means to its said gripping position.

4,000,955

FAN WITH WIDE CURVED BLADES

Kiyoshi Tokutomi, 490 N. 5th St., San Jose, Calif. 95112

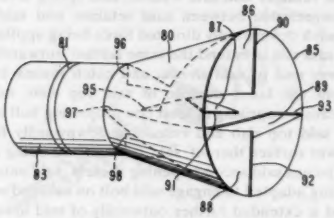
Filed Sept. 22, 1975, Ser. No. 615,486
Int. Cl.² F04D *29/44*
U.S. Cl. 415—183 **6 Claims**

1. A rotating device in combination with an air collector comprising:

a rotatable shaft having a longitudinal axis;

a plurality of blades spaced apart mounted on the shaft,

each blade extending from the shaft in an arc of a curvature wherein the radial center of the arc lies along an imaginary line extending between the shaft center and the outer tip of the arc farthest from the shaft, each blade being attached to the shaft at a point approximately 90° away from the imaginary line for a particular blade; and a funnel-shaped air collector, having a wide open end and a narrow open end, with a plurality of spaced fins attached



to a portion of and extending through the interior of the collector, said fins starting at the wide end of the collector and extending toward the narrow end, with the two ends of each fin being aligned so that they are out of phase with each other by approximately 360° divided by the number of fins in the collector, said collector adjacent to said plurality of blades with the narrow end of said collector pointing toward the blades.

4,000,956

IMPACT RESISTANT BLADE

Robert G. Carlson, Greenhills, and Robert W. Harrison, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 643,495
Int. Cl.² F01D 5/28
U.S. Cl. 416—230 **7 Claims**

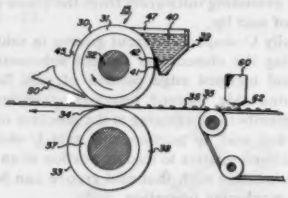
1. A blade for use in a fluid flow machine, said blade having a tip portion and a root portion fabricated of a plurality of bonded filament laminates, said laminates characterized by a plurality of continuous collimated filaments embedded in a first matrix at the blade root and a second matrix at the blade tip, said first and second matrices being bonded together at a common interface, said second matrix comprising two materials sandwiching said filaments and characterized by a greater impact strength than said first matrix and wherein the first of said materials is characterized by a greater bondability to itself and to said filaments relative to said second material.

4,000,957

CONTACT FUSER AND RELEASE AGENT APPLICATOR THEREFOR

John G. Ruhland, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1975, Ser. No. 616,458
Int. Cl.² G03G 13/00
U.S. Cl. 427—22 **8 Claims**



1. Apparatus for fixing toner images to support material, said apparatus comprising:

a heated fuser structure operative to soften said toner images;

a backup member cooperating with said heated fuser structure to form a nip through which said support material moves with said toner images contacting said heated fuser structure;

means for applying a first release material to the surface of said heated structure, said first release material being a liquid at the operating temperature of said fuser structure; and

means for applying a second release material to said heated structure, said second release material being chemically inert and solid at the operating temperature of said fuser structure and forming a layer on said fuser structure which contacts the toner in its molten condition whereby separation of said support material is facilitated.

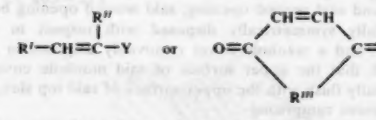
4,000,958

METHOD FOR TREATING LEATHER

Masaaki Hirooka, Kyoto; Yoshikazu Fujii, Ibaragi, and Kazuhiko Hata, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 14, 1975, Ser. No. 567,846
Claims priority, application Japan, Apr. 17, 1974, 49-43761
Int. Cl.² B05D 3/02
U.S. Cl. 427—389 **48 Claims**

1. A method for treating a leather, which comprises treating a leather with a copolymer [II] obtained by polymerizing 5 to 2,000 parts by weight of at least one member selected from the group consisting of acrylic esters and methacrylic esters which contain, as the alcohol moiety, a hydrocarbon- or halohydrocarbon-group having 1 to 20 carbon atoms, and 500 parts by weight or less of at least one vinyl compound having the formula:



wherein R^I and R^{II} are independently a hydrogen atom, a halogen atom, a hydrocarbon- or halohydrocarbon-group having 1 to 8 carbon atoms, or Y; Y is a group having 1 to 20 carbon atoms and having a group selected from the group consisting of a carboxyl group, acid halide groups, a hydroxyl group, ether groups, and oxygen-containing cyclic compound residues; R^{III} is an oxygen atom or >N-R^{IV} wherein R^{IV} is a hydrogen atom or a hydrocarbon- or halohydrocarbon-group having 1 to 8 carbon atoms, in the presence of 100 parts by

weight of a coploymer [1] comprising as essential components at least one monoethylenically unsaturated ester compound having 4 to 22 carbon atoms, and at least one member selected from the group consisting of monoethylenically unsaturated hydrocarbon compounds having 2 to 20 carbon atoms or halogen-substituted derivatives thereof.

4,000,959

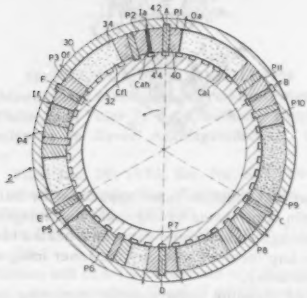
FREE-PISTON ROTARY DEVICE PARTICULARLY USEFUL AS HYDRAULIC MOTOR OR PUMP

Iza Portugali, 14 Givati St., Apt. 17, Afridar, Ashkelon, Israel

Filed Mar. 17, 1975, Ser. No. 559,239

Int. Cl.² F01C *1/00*; F03C *3/00*; F04C *1/00*

U.S. Cl. 418—35 **8 Claims**



1. A rotary device comprising a stator; a rotor mounted coaxially for rotary movement with respect to the stator and defining an annular gap therewith; a plurality of pistons movable within said annular gap in a circumferential direction with respect thereto; each of said pistons including a coupling member movable from a first position coupling the piston to the stator, to a second position coupling the piston to the rotor; and positioning means including a source of pressurized fluid and a fluid distributor including a stationary member fixed to said stator and having a plurality of passageways leading to different locations of the stator at which the coupling members are coupleable to the stator, and a rotary member driven by the rotor to control the flow of the fluid from said pressurized fluid source to said passageways in synchronized timed relationship to the rotation of the rotor such that the coupling members are alternately coupled to the stator and to the rotor to form alternating expansible and contractable chambers between successive pistons.

4,000,960

APPARATUS FOR MANUFACTURING SYNTHETIC TOW FOR STRETCH-CUT SPINNING PROCESS

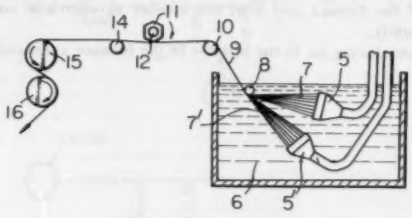
Noboru Oguchi; Takashi Hiramatsu; Ikuo Igami, all of Nagoya; Akira Aoki, Inazawa; Syogo Tanaka, Otake; Toshiro Seki, Otake, and Takao Inoue, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 277,990, Aug. 4, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,974

Int. Cl.² D01D *5/20*

U.S. Cl. 425—76 **6 Claims**

1. An apparatus for continuously producing a synthetic filament's tow from a plurality of synthetic filaments comprising a pair of guide rollers for leading said filaments from spinnerets to a transfer roller for guiding said filaments to a take-up means, a guide disposed at a position where coagulation of said filaments has not been completed, deviation bar means provided with a plurality of transverse radially projecting edges for periodically deviating passage of said tow during rotation of said bar means from a passage defined only by said guide rollers by means of rotational contact of each of said edges with said tow, said bar means being rotatably mounted on an axis transversal to said filaments and disposed just before or after a particular position on a passage defined by said



pair of guide rollers were coagulation of said filaments are completed.

4,000,961

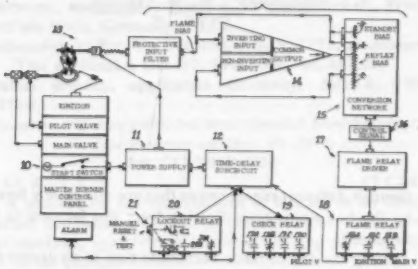
PRIMARY FLAME SAFEGUARD SYSTEM

Richard F. Mandock, Rockford, Ill., assignor to Eclipse, Inc., Rockford, Ill.

Filed Aug. 26, 1975, Ser. No. 607,917

Int. Cl.² F23N *5/12*

U.S. Cl. 431—2 **19 Claims**



1. The method of producing a control signal from a source of flame-detection current which comprises: deriving flame bias of predetermined polarity from said current; applying said flame bias to input means in a reflexive amplifying means having output means connecting into a conversion network operative to produce a plurality of reflex bias voltages of predetermined polarity and magnitude operative in said input means to produce a regenerative common output in said network and a resultant control signal available as output from said network and having two states of opposite polarity depending upon whether or not said flame bias acts in said input means, there being a first state in the absence of said flame bias which is of a first polarity, and a second state in the presence of said flame bias which is of a second and reverse polarity, said control signal having two states respectively corresponding to said first and second polarities.

4,000,962

METHOD OF HEATING UP GLASS MELTING FURNACES OR THE LIKE

Maurice Hemingway, Mirfield, and Trevor Ward, Dewsbury, both of England, assignors to Hotwork International Limited, England

Filed May 12, 1975, Ser. No. 576,263

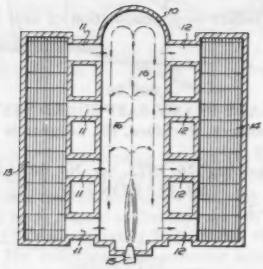
Claims priority, application United Kingdom, May 14, 1974, 21175/74

Int. Cl.² F27D *7/00*

U.S. Cl. 432—4 **2 Claims**

1. A method of pre-heating a refractory lined furnace and the regenerators associated with it to bring the furnace and regenerators up to working temperature, comprising the steps of

1. injecting a flow of hot gases into the furnace from one or more high velocity burners of the nonradiant type whereby the injected gases circulate around the interior of the furnace and heat the interior substantially uniformly,
2. introducing air to the interior of the furnace alternately



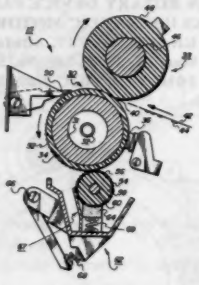
through different regenerators that are alternately heated by the hot waste gases flowing from the furnace to the flue, and
3. causing the one or more burners to pass to an excess fuel condition whereby the air introduced through the regenerators is consumed within the furnace by combustion with the excess fuel.

4,000,963

CLEANING APPARATUS FOR A HEAT AND PRESSURE FUSER

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 21, 1975, Ser. No. 597,735
Int. Cl.² G03G 13/08
U.S. Cl. 432—60 8 Claims



1. In a heat and pressure fuser apparatus for fixing toner images wherein copy sheets having said toner images thereon are passed through a nip formed between a heated fuser member and a backup member whereby the toner images contact said heated member,

an improved cleaning apparatus for removing toner and other contaminants from the surface of said heated member, said cleaning apparatus comprising:

a tacky-surfaced cleaning member supported at least part of the time in contact with said heated fuser member, and

means for rejuvenating said tacky surface cleaning member whereby the surface thereof maintains its capacity to effectively remove said contamination from said heated fuser member; and

said means for rejuvenating said tacky-surfaced cleaning member comprising means for applying a coating of polymer material which is tacky at the operating temperature of said cleaning member.

4,000,964

POLYCHROMATOGRAPHIC DYEING

Clifford Newton, Stockport, England, assignor to BSG Designs Inc., London, England

Filed Dec. 10, 1974, Ser. No. 531,390

Claims priority, application United Kingdom, Dec. 15, 1973, 58237/73; May 24, 1974, 23245/74; Aug. 14, 1974, 35683/74

Int. Cl.² D06P 3/00

U.S. Cl. 8—14 4 Claims

1. A method of effecting coloration of a dyeable substrate having interstices which comprises filling the interstics in the substrate with a mixture of dye liquors of different colors and different fixation properties, fixing at least one of said dye liquors, applying to said substrate an eluant for another of said dye liquors to promote migration thereof, fixing said migrated dye liquor and washing and finishing said substrate.

4,000,965

METAL COMPLEX DYESTUFFS

Winfried Mennicke, Leverkusen, Germany; Peter Suchanek, Scotch Plains, and Peter F. Vogt, Berkeley Heights, both of N.J., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 29, 1975, Ser. No. 545,119

Claims priority, application Germany, Jan. 30, 1974, 2404314; Sept. 11, 1974, 2443483

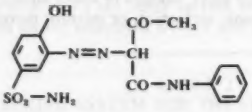
Int. Cl.² C09B 27/00, 45/48; D06P 1/10

U.S. Cl. 8—26 18 Claims

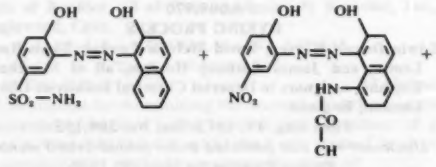
1. The lithium salt of a 1:2 chromium or 1:2 cobalt complex of a monoazo or azomethine dyestuff which before metallization contains a O,O′-dihydroxy-O-hydroxy-O′-amino-azo or -azomethine group.

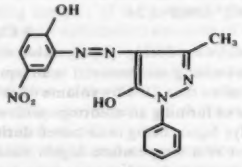
13. Process for the preparation of concentrated solutions of 1:2-azo- and azomethine complex dyestuffs, characterized in that the metallisable dyestuffs are chromated in hydroxyl group containing solvents in the presence of alkaline lithium salts with chromium acetate or chromium formate.

14. Lithium salt of the cobalt complex of the dyestuff of the formula

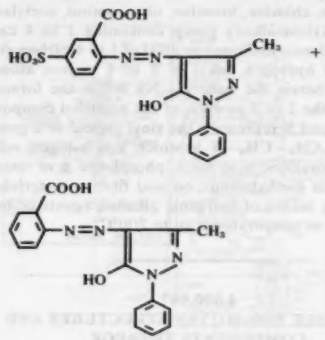


15. Lithium salt of the chromium complex of the mixtures of the dyestuffs of the formulae





16. Lithium salt of the chromium complex of the mixtures of the dyestuffs of the formulae



4,000,966

DYEING CELLULOSE WITH AMINONAPHTHYL AZOBENZENE VINYL TYPE REACTIVE DYES

Fritz Meininger, Frankfurt am Main; Ludwig Schlafer, Fischbach, Taunus, and Maria Kallay, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 160,153, July 6, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,205

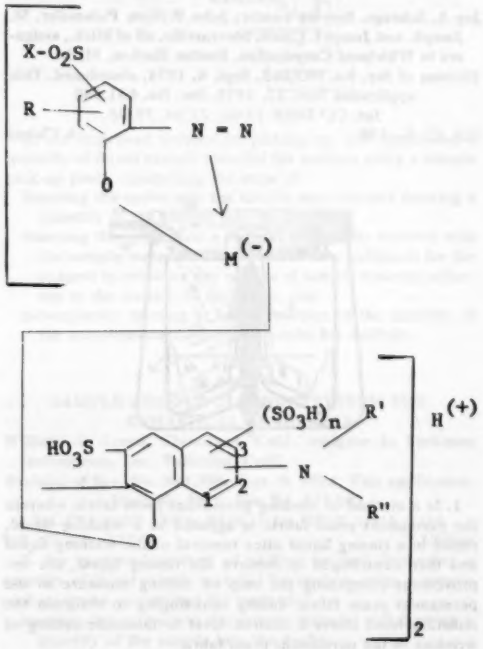
Claims priority, application Germany, July 8, 1970, 2033784

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² D06P 3/00

U.S. Cl. 8—1 E 17 Claims

1. A process for the manufacture of fast prints on fibrous materials consisting of or containing cellulose which comprises applying symmetrical metal-containing reactive dyestuffs of the general formula



in which M represents a cobalt or chromium atom, R represents hydrogen, chlorine, bromine, nitro, amino, acetylamino or a lower alkyl or alkoxy group containing 1 to 4 carbon atoms, R′ represents hydrogen or alkyl of 1 to 4 carbon atoms, R″ represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl, and wherein the moiety —NR′R″ in the formula is substituted in the 2 or 3 position of the naphthol component, *n* is zero or 1 and X represents the vinyl radical or a group of the formula $-CH_2-CH_2-Y$ in which Y is halogen, sulfuric acid ester, thiosulfuric acid ester, phosphoric acid ester, dimethylamino or diethylamino, on said fibrous materials and fixing them by means of inorganic alkaline agents or by the action of heat at temperatures up to 200°C.

4,000,967

WETTABLE NON-WOVEN STRUCTURES AND COMPONENTS THEREOF

Burnett H. Johnson, and Terrence Huff, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 149,677, June 3, 1971, Pat. No. 3,765,948. This application July 26, 1973, Ser. No. 372,232

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² D06B *1/00*

U.S. Cl. 8—115.5 **15 Claims**

1. An improved process for preparing wettable and rewettable polyolefin non-woven mats which comprises:

contacting a non-wettable non-woven mat of polyolefin fibers having a porosity greater than 40 percent with a gaseous sulfur dioxide-chlorine mixture in the presence of ultraviolet light under conditions to obtain at least 1.0 weight percent sulfur in said mat.

4,000,968

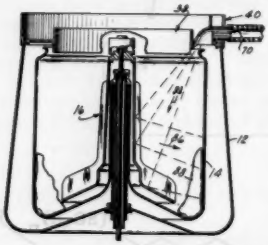
PERMANENT PRESS CYCLE FOR AUTOMATIC WASHER

Joy A. Schrage, Berrien Center; John William Pielemeier, St. Joseph, and James I. Czech, Stevensville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 503,665, Sept. 6, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,440

Int. Cl.² D06F *13/02, 23/04, 39/08*

U.S. Cl. 8—158 **6 Claims**



1. In a method of washing permanent press fabric wherein the permanent press fabric is agitated in a washing liquid, rinsed in a rinsing liquid after removal of the washing liquid and then centrifuged to remove the rinsing liquid, the improvement comprising the step of: adding moisture to the permanent press fabric during centrifuging to maintain the moisture level above a desired level to minimize setting of wrinkles in the permanent press fabric.

4,000,969

DYEING AND PRINTING SYNTHETIC HYDROPHOBIC FIBERS WITH A CARRIER COMPRISING PHENYL CYCLOHEXANE AND DERIVATIVES

Kurt A. Dellian, and Jayanti V. Isharani, both of Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

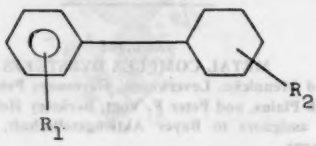
Filed Dec. 27, 1974, Ser. No. 537,058

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² D06P *5/04, 1/673*

U.S. Cl. 8—173 **9 Claims**

1. In a process for coloring a textile fiber with a disperse, acid, basic or premetallized dyestuff with the aid of a carrier, the improvement comprising using as a carrier a compound of the general formula:



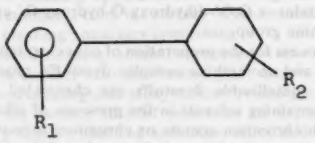
where

R_1 is hydrogen or lower alkyl; and

R_2 is hydrogen, lower alkyl, halogen or lower alkoxy.

6. A composition comprising

a. a compound of the formula



where

R_1 is hydrogen or lower alkyl; and

R_2 is hydrogen, lower alkyl, halogen or lower alkoxy, and

b. an anionic or nonionic surfactant, or mixture thereof.

4,000,970

DYEING PROCESS

Edwin Dennis Harvey; David Melville Fawkes; Denis Ronald Lemin, and James Anthony Hawkes, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 17, 1973, Ser. No. 389,155

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² D06P *3/24*

U.S. Cl. 8—178 R **9 Claims**

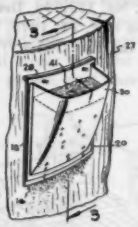
1. A process for the batchwise dyeing of polyamide textile materials which comprises treating said material in an aqueous dye liquor containing not more than 10% by volume of at least one organic liquid capable of forming an azeotrope with water and an anionic dye, said dye liquor being maintained during at least part of the treatment at a temperature higher than the boiling point of said azeotrope and under a pressure greater than atmospheric pressure, and then recovering the organic liquid, by distillation before removing the textile material from the aqueous dye liquor.

4,000,971

LIQUID APPLYING MEANS

Thomas Gaskins, Palmdale, Fla. 33944

Filed Feb. 3, 1976, Ser. No. 654,789
Int. Cl.² B27K 3/02
U.S. Cl. 21—63 9 Claims



1. Liquid applying means for slowly applying treatment liquid to wooden structural members or the like, said liquid applying means comprising a generally flat support panel having an inner face engageable with the outer surface of a structural member, said flat support panel also having an outer face, an upper edge and a lower edge, attachment means for enabling said support panel to be attached to and supported by such a structural member above a treatment area of the structural member to which it is desired to apply treatment liquid, flexible sheet member means, means bonding said flexible sheet member means to said outer face of said support panel so that said flexible sheet member defines at least one pouch-like member movable between a first position in which it abuttingly engages the outer face of said flat support panel and an extended position in which said flexible pouch-like member bulges outwardly from the outer face of said flat support panel so as to define at least one opentopped volumetric space between said flexible sheet member and said flat support panel in which liquid can be received and stored and liquid discharge openings in said flexible sheet member for permitting liquid in said volumetric space to be gradually discharged through said liquid discharge openings for gravitational flow down the outer surface of said flexible sheet for deposit on the treatment area of said structural member.

4,000,972

MEASURING SYSTEM FOR THE PHARMACOLOGICAL MANIPULATION OF THE COAGULATION MECHANISM IN BLOOD AND FOR THE ELAPSED COAGULATION TIME

Walter Jacob Braun; John Henry Altshuler, both of Englewood; Gerald Lance Schlatter, and Robert LeRoy Poland, both of Boulder, all of Colo., assignors to Hemotec, Inc., Englewood, Colo.

Filed Jan. 16, 1976, Ser. No. 649,648
Int. Cl.² G01N 33/16
U.S. Cl. 23—230 B 43 Claims

39. A method for determining the amount of anticoagulant or neutralizing additive to be injected into the blood of a patient so that said blood is maintained at a desired level of anticoagulant, said method comprising the steps of:

taking samples of the patient's blood,

mixing predetermined amounts of varying concentrations of the neutralizing additive into each of the samples,

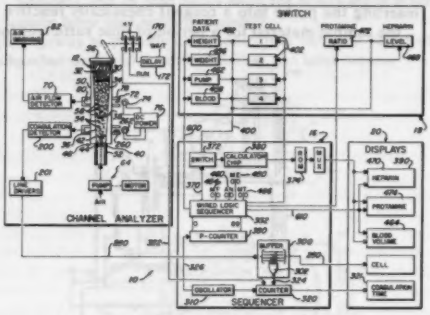
storing the concentration information of the additive in relation to the identity of each sample,

signalling the identity of the sample which is the first to coagulate,

reading the stored concentration information for the first sample to coagulate in response to said identify signal,

determining the amount of anticoagulant with the blood in response to the reading of the concentration information of the additive within the first sample to coagulate, and

determining the amount of desired anticoagulant to be



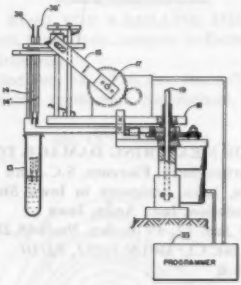
injected in response to the determination of the amount of anticoagulant already in the blood.

4,000,973

SAMPLE RESIDUE CLEANING SYSTEM FOR BIOLOGICAL ANALYZERS

Arne J. Petersen, Newport Beach, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sept. 9, 1974, Ser. No. 504,390
Int. Cl.² G01N 31/00, 33/16
U.S. Cl. 23—230 R 7 Claims



1. An improved method of picking up and dispensing a quantity of liquid sample material for analysis using a sample pick-up probe comprising the steps of:

inserting the probe into the sample material and drawing a quantity of the sample into the probe;

inserting the probe into a reagent chemically reactive with the sample material for a period of time sufficient for the reagent to consume any residue of sample material adherent to the outside of the probe; and

subsequently ejecting at least a portion of the quantity of the sample material from the probe for analysis.

4,000,974

SAMPLE RESIDUE CLEANING SYSTEM FOR BIOLOGICAL ANALYZERS

William A. Acord, Claremont, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

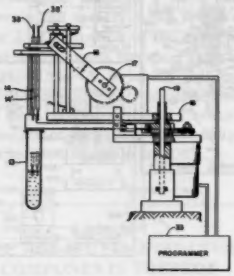
Division of Ser. No. 504,390, Sept. 9, 1974. This application Mar. 31, 1976, Ser. No. 672,081
Int. Cl.² B65B 43/56; B67C 3/16; G01N 33/16, 1/14
U.S. Cl. 23—230 R 7 Claims

1. An improved method of picking up and dispensing a quantity of liquid sample material for analysis using a sample pick-up probe comprising the steps of:

inserting the probe into the sample material and drawing a quantity of the sample into the probe;

removing the probe from the sample material and drawing a bubble of air into a tip end of the probe;

inserting the probe into a reagent chemically reactive with the sample material for a period of time sufficient for the



reagent to consume any residue of sample material adherent to the outside of the probe, the air bubble isolating the sample in the probe from the reagent; and

subsequently ejecting the air bubble and at least a portion of the sample material from the probe for analysis.

4,000,975

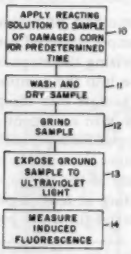
METHOD OF MEASURING DAMAGE TO GRAIN

Gerald Davis Christenbury, Florence, S.C., and Wesley Fisher Buchele, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 12, 1976, Ser. No. 648,285

Int. Cl.² G01N *21/52, 33/10*

U.S. Cl. 23—230 B **10 Claims**



1. A method of measuring mechanical damage to grain comprising: applying a solution to a sample of the damaged grain for a predetermined time, said solution containing a material which selectively chemically bonds to interior protein of said grain, said interior protein having been exposed by said mechanical damage, and which does not bond to other portions of the grain to an appreciable extent, wherein the resulting products fluoresce when irradiated; grinding said sample grains to which said solution has been applied; exposing said ground sample to a source of radiation which induces said fluorescence; and measuring the induced fluorescence of the ground sample, which measurement defines the mechanical damage of said grain.

4,000,976

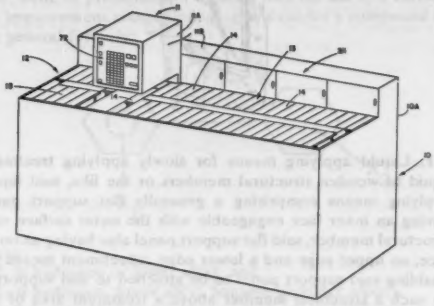
APPARATUS AND METHOD FOR PREPARING, DILUTING AND REPLICATING LABORATORY SAMPLES

Charles E. Kramer, Northbrook, and Menachem Tiger, Mount Prospect, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 312,894, Dec. 7, 1972, abandoned. This application Apr. 11, 1975, Ser. No. 567,349

Int. Cl.² G01N *1/18*

U.S. Cl. 23—259 **43 Claims**



1. A method for preparing samples, including dilutions of a specimen and replication of said specimen and dilution thereof, for use with a source of diluent, and sample preparation apparatus including a dosing tip, a dosing pump means in gated communication with said tip and said diluent source, and a process controller for providing command signals coordinating and governing operation of said apparatus, said method comprising the steps of:

aspirating a specimen of a given dilution thereof into said dosing tip by means of said pump, in response to first command signals from said process controller;

dispensing in proportional fractions a portion of said specimen or given dilution by means of said dosing pump means in response to second command signals through said dosing tip into a plurality of replication receptacles to replicate said specimen or given dilution;

aspirating a quantity of diluent from said diluent source into said pump means in response to third command signals,

dispensing the remaining specimen or given dilution previously aspirated, along with said quantity of diluent, by means of said dosing pump means in response to fourth command signals through said dosing tip into a holding receptacle to form a subsequent dilution.

4,000,977

APPARATUS FOR PRODUCING MONOCRYSTALS BY THE VERNEUIL TECHNIQUE

Richard Falckenberg, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 28, 1975, Ser. No. 563,165

Claims priority, application Germany, Mar. 28, 1974, 2415110

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

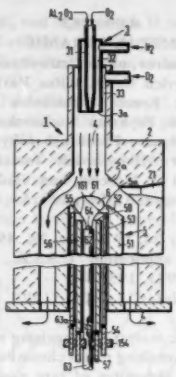
Int. Cl.² B01J *17/24*

U.S. Cl. 23—273 V **5 Claims**

1. An apparatus for producing monocrystals having a relatively large cross-section by the Verneuil technique wherein a seed crystal is mounted on a movable crystal support member within a furnace means having a burner guiding flame gases and crystal growth material to impinge against said seed crystal so that said material melts and adheres to the seed crystal and forms a monocrystal which grows axially upwardly there-

from while the crystal support member is moved axially downwardly a distance corresponding to the amount of axial crystal growth so that substantially uniform growth conditions are maintained throughout the crystal growing process; the combination comprising:

a relatively massive flame deflector member positioned within the furnace means in spaced registry from the burner and having a central through passage therein which radially surrounds and is spaced from the crystal support member, said through passage having an outer diameter somewhat larger than the cross-section of the monocrystal being grown, said flame deflector member



having a mass relative to the monocrystal being grown sufficient to form a heat reservoir for said monocrystal after burner shut-down, said flame deflector member having upper conical outwardly beveled surfaces extending radially away from said through passage therein for laterally deflecting flame gases impinging on the upper surface of the monocrystal being grown; and

at least on axially movable insert member positioned within said through passage of the deflector member and radially spaced from the crystal support member and said deflector member, said insert member being selectively movable in relation to said deflector member and said crystal support member.

4,000,978

THERMAL RECOMBINER

James O. Henrie, Hidden Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 340,148, March 12, 1973. This application Sept. 30, 1974, Ser. No. 510,682

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B01J *1/14;* **C01B** *5/00*

U.S. Cl. 23—277 R **3 Claims**

1. Apparatus for thermally recombining gases, said apparatus comprising:

a first chamber provided with heating means for initially heating the gases to be combined to a temperature above the threshold for thermal recombination of said gases;

a second chamber comprising:

an outer shell having closed ends,

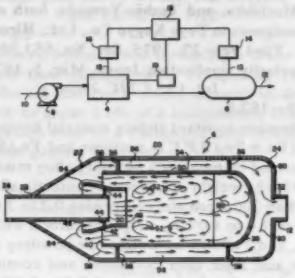
a generally cup-shaped member mounted coaxially within said outer shell in spaced relation with said outer shell,

gas inlet means positioned to deliver gases into said cup-shaped member and cause mixing of reacted gases in said second chamber with the gases being delivered thereto,

an open-ended shroud encircling said gas inlet means to form a venturi section and provide for mixing a portion of the previously reacted gases with the gases delivered through said gas inlet means, and

gas outlet means communicating with the space between the closed end of said cup-shaped member and the adjacent end of said outer shell for removing reacted gases from said second chamber;

a passageway to provide communication between said first chamber and said second chamber gas inlet means;



a temperature sensing means associated with said second chamber for sensing the temperature therein; and

a temperature control means for controlling said first chamber heating means in response to the temperature sensed in second chamber by said temperature sensing means to substantially maintain a desired temperature in said second chamber.

4,000,979

ROLL FOR A ROLLING MILL

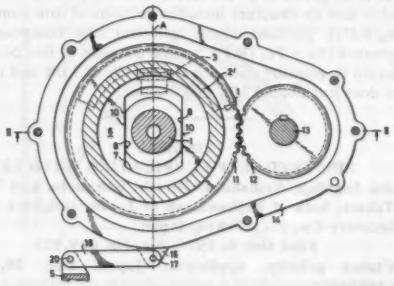
Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 18, 1976, Ser. No. 659,095

Claims priority, application Switzerland, Feb. 18, 1975, 2023/75

Int. Cl.² B60B *15/16*

U.S. Cl. 29—115 **5 Claims**



1. A sag-compensating roll for a rolling mill which comprises

a. a stationary support beam,

b. a roll shell rotatable about said beam,

c. hydrostatic support means for supporting said shell on said beam,

d. external annularly disposed gear teeth at one end of said roll shell,

e. a transmission casing encircling said one end of the roll shell,

f. bearing means encircling said end of the roll shell on each side of said annularly disposed gear teeth for rotatably mounting said casing on said end,

g. gear means rotatably mounted in said casing and cooperating with said annularly disposed gear teeth for driving said roll shell,

h. and torque support means connected between said casing and a fixed support for restraining rotation of the casing with respect to the fixed support.

4,000,980

ABRASION-RESISTANT SLIDING MATERIAL

Tsuyoshi Morishita, and Toshio Yamada, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Feb. 27, 1975, Ser. No. 553,807

Claims priority, application Japan, Mar. 1, 1974, 49-25018

Int. Cl.² C22C *29/00*

U.S. Cl. 29—182.5 **8 Claims**

1. An abrasion-resistant sliding material having a structure including (Fe + Fe_3(B,P,C)) portions and Fe_3(B,C) portons, which is formed by molding a powdery alloy mixture comprising 70 to 98% by weight of a powdery eutectic alloy of particle size finer than 200 mesh and comprising 0.2 to 3.0% by weight of boron and 1.0 to 4.0% by weight of carbon with the balance being iron, and 2 to 30% by weight of a powdery eutectic alloy of particle size finer than 200 mesh and comprising 3.0 to 7.0% by weight of a phosphorus and 0.5 to 2.5% by weight of carbon with the balance being iron, into a desired shape under a compression pressure of 0.5 to 3.0 t/cm², and sintering the molded alloy mixture at a temperature of 950° to 1130° C, for at least 5 minutes.

8. A method of producing an abrasion-resistant sliding material comprising forming a powdery mixture consisting of (a) about from 70 to 98%, by weight, of a first eutectic alloy consisting of about from 0.2 to 3.0%, by weight, of boron, about from 1.0 to 4.0%, by weight of carbon, and the balance being iron, said first eutectic alloy having a particle size finer than 200 mesh, and (b) about from 2 to 30%, by weight, of a second eutectic alloy consisting of about from 3.0 to 7.0%, by weight, of phosphorus, about from 0.5 to 2.5%, by weight, of carbon, and the balance being iron, said second eutectic alloy also having a particle size finer than 200 mesh, compression molding the resulting mixture into a desired shape at a compression pressure of about from 0.5% to 3.0 t/cm², and sintering the resulting molded product at a temperature of about from 950° to 1130° C. for at least 5 minutes in an atmosphere of an inert gas or in a vaccum, to obtain a product characterized in that its structure includes portions of iron compounds [Fe_3(B,C)], portions where iron and iron compounds are copresent [Fe + Fe_3 (B,P,C)], and portions of fine pores, and wherein its porosity does not exceed about 7.0% and the pore size does not exceed 50μ in diameter.

4,000,981

SINTERED SELF-LUBRICATING ARTICLE

Akira Sugafuji, Kamakura; Hiroshi Kurimoto, and Tadaaki Takase, both of Fujisawa, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1975, Ser. No. 619,932

Claims priority, application Japan, Dec. 28, 1974, 49-149168

Int. Cl.² B22F *5/00*

U.S. Cl. 29—182.5 **8 Claims**

1. A sintered self-lubricating article having great oxidation resistance, high dimension stability and high wear resistance at elevated temperatures without assistance of any other lubricants and consisting essentially of 5 to 10 percent by weight of tin, 8 to 40 percent by weight of zinc, 5 to 15 percent by weight of graphite and the balance being copper.

4,000,982

BEARING MATERIAL

Hiroshi Ueda, Nagoya, Japan, assignor to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Apr. 10, 1975, Ser. No. 566,788

Int. Cl.² B22F *3/26, 7/04, 5/00*

U.S. Cl. 29—182.3 **6 Claims**

1. In a bearing material comprising a metal back, a porous sintered metal matrix layer bonded to a surface of said metal back, said metal layer consisting essentially of particles of a metal selected from the group consisting of iron, iron alloys, copper and copper alloys; and a composition impregnated into and substantially filling the voids in said metal layer and forming a surface layer thereon, the improvement which comprises: said composition consists essentially of a uniform blend of 45 to 94 percent by weight of polytetrafluoroethylene, 5 to 50 percent by weight of zinc metal powder and 1 to 5 percent by weight of aluminum oxide powder.

4,000,983

METAL-CERAMIC

Vladimir Ilich Alexandrov, ulitsa Ostrovityanova, 31, kv. 281; Vyacheslav Vasilievich Osiko, ulitsa Vavilova, 48, kv. 63, both of Moscow; Ernest Nikolaevich Muraviev, ulitsa Popova, 10, kv. 36, Fryazino Moskovskoi oblasti; Eduard Georgievich Spiridonov, Preobrazhensky val, 24a, kv. 1, Moscow; Vladimir Mikhailovich Tartarintsev, Leninsky prospekt, 45, kv. 112, Moscow, and Vladimir Grigorievich Gordon, 13 Parkovaya, 31, korpus 1, kv. 83, Moscow, all of U.S.S.R.

Filed July 24, 1974, Ser. No. 491,519

Claims priority, application U.S.S.R., July 26, 1973, 1935249; July 26, 1973, 1935248

Int. Cl.² C22C *31/00*

U.S. Cl. 29—182.5 **2 Claims**

1. A metal-ceramic material comprising metallic chromium and at least one high-melting metal chromite selected from the group consisting of chromites of rare earth metals, yttrium chromite, and scandium chromite.

4,000,984

HIGH SILICON-CONTAINING AUSTENITIC-IRON-CHROMIUM-NICKEL ALLOYS

Anton Bäumel, Meerbusch, Germany, assignor to Gebr. Bohler & Co. AG, Wein, Austria

Continuation-in-part of Ser. Nos. 479,140, June 13, 1974, abandoned, Ser. No. 479,550, June 14, 1974, abandoned, and Ser. No. 479,551, June 14, 1974, abandoned. This application July 14, 1975, Ser. No. 595,416

Claims priority, application Germany, June 19, 1974, 2331098

Int. Cl.² C22C *38/26, 38/34*

U.S. Cl. 29—183 **4 Claims**

1. In construction parts, such as furnace grills, rollers of continuous heating furnaces and reaction pipes in the petrochemical industry, operating at temperatures above 800° C in carburizing or air combustion atmospheres or at temperatures above 400° C in a nitriding atmosphere, the improvement being that said construction parts are manufactured from a high silicon-containing, austenitic iron-chromium-nickel alloy consisting of 0.01–0.25% C, 3.5–5.0% Si, 0.0–2.0% Mn, 17.0–20.0% Cr, 14.0–18.0% Ni, 0.0–0.2% N, 1.0–2.0% Nb with the remainder being iron and unavoidable impurities.

4,000,985

AZO DYES HAVING A HIGH SOLUBILITY IN PETROLEUM FUELS

Richard B. Orelup, Upper Saddle River, N.J., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 601,015, Aug. 1, 1975, abandoned. This application Oct. 24, 1975, Ser. No. 625,679

Int. Cl.² C10L *1/22;* **C07C** *107/04*

U.S. Cl. 44—59 **21 Claims**

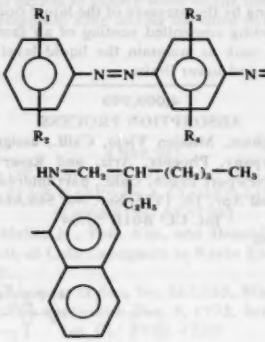
1. An azo dye having a high solubility in petroleum fuels and having the formula

in which R_1, R_2, R_3 and R_4 are each H or CH_3 and R_5 is either 2-ethylhexyl or 2-ethylhexyloxypropyl, wherein:

A. when R_5 is 2-ethylhexyl, then at least one of said R_1, R_2, R_3 and R_4 is CH_3;

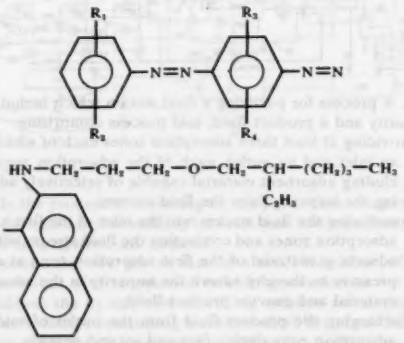
B. when R_5 is 2-ethylhexyloxypropyl, then each of said R_1, R_2, R_3 and R_4 is either, H or CH_3 provided that R_1 and R_3 are not both CH_3 at the same time when R_2 and R_4 are both H, or R_2 and R_4 are not both CH_3 at the same time when R_1 and R_3 are both H.

18. A colored petroleum fuel having dissolved therein an azo dye composition having the general formula



in which R_1, R_2, R_3 and R_4 are each H or CH_3 with the proviso that at least one of said R_1, R_2, R_3 and R_4 is CH_3.

19. A colored petroleum fuel having dissolved therein an azo dye composition having the formula



in which each of R_1, R_2, R_3 and R_4 is H or CH_3, with the proviso that R_1 and R_3 are not both CH_3 at the same time when R_2 and R_4 are both H, and R_2 and R_4 are not both CH_3 at the same time when R_1 and R_3 are both H.

4,000,986

ADDITIVES TO IMPROVE THE FLOW OF HEAVY FUELS AND CRUDE OILS

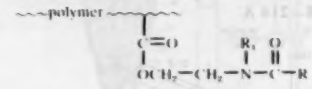
Edward H. Specht, Huntingdon Valley, and James H. O'Mara, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 15, 1975, Ser. No. 541,176

Int. Cl.² C10L *1/22*

U.S. Cl. 44—62 **8 Claims**

1. An improved hydrocarbon oil having a lower pour point and improved flow characteristics comprising (a) a major amount of the oil and (b) a minor amount in the range of about 0.005% to about 1.0% of a composition comprising an N-acylaminoethyl ester of a carboxylic acid-containing polymer having the general formula:



where R is an alkyl or alkene group having about 11 to 29 carbon atoms, and where R_1 is H or an alkyl group having 1 to 4 carbon atoms.

4,000,987

LOW-TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS

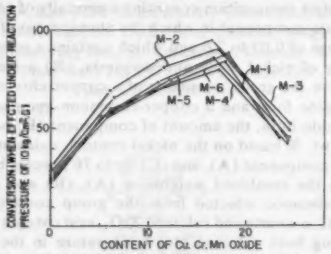
Akio Okagami, Fuchu; Kunihiko Uemoto, Yokohama, and Kouichi Satoh, Noganei, all of Japan, assignors to Japan Gasoline Co., Ltd. and Nikki Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 430,711, Jan. 4, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,303

Claims priority, application Japan, Feb. 3, 1973, 48-013961

Int. Cl.² C10G *11/28*; C01B *2/16*

U.S. Cl. 48—214 A **10 Claims**



1. In a process for manufacturing a methane-containing gas by subjecting steam-reformable feed hydrocarbons to adiabatic low-temperature steam reforming in the presence of a nickel catalyst, the improvement which comprises preheating a mixture of said feed hydrocarbon with steam, mixed in the ratio of moles of steam to the number of moles of carbon atoms in said feed hydrocarbon in the range of 0.9 to 5.0, to a temperature in the range of 250° to 600° C, feeding the preheated mixture into a steam reforming reaction zone containing a catalyst composition consisting essentially of (A) Ni—NiO—MgO or Ni—MgO, in which the atomic ratio of Ni/Mg is in the range of 0.5 to 5.0, (B) a member selected from the group consisting of Cu—Cr in oxide form and Cu—Cr—Mn in oxide form, the amount of component (B), calculated as the metals, being from 10 to 25 wt.% based on the nickel content, calculated as nickel metal, of component (A), and (C) up to 70 percent by weight, based on the combined weights of (A), (B) and (C), of a carrier substance selected from the group consisting of α-Al_2O_3, SiC, α-quartz and cal-

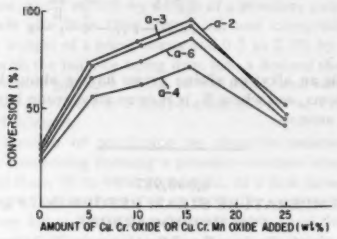
cined ZrO_2 calcined at 1500° C for 20 hours, and effecting steam reforming of said feed hydrocarbons by maintaining the temperature of the said catalyst in the range of 300° to 600° C and the pressure of the reaction zone in the range of 10 to 100 kg/cm²G.

4,000,988

LOW-TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS

Kunihiko Uemoto; Satoru Shichiji, and Yoshinori Amemiya, all of Yokohama, Japan, assignors to Japan Gasoline Co., Ltd. and Nikki Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 430,741, Jan. 4, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 572,634
Claims priority, application Japan, June 20, 1973, 48-68718
Int. Cl.² C10G *11/28*; C01B *2/16*
U.S. Cl. 48—214 A **11 Claims**



1. In a process for manufacturing a methane-containing gas by subjecting steam-reformable feed hydrocarbons to adiabatic low-temperature steam reforming in the presence of a nickel catalyst, the improvement which comprises preheating a mixture of said feed hydrocarbon with steam mixed in the ratio of moles of steam to the number of moles of carbon atoms in said feed hydrocarbon in the range of 0.9 to 5.0 to a temperature in the range of 250° to 600° C, feeding the preheated mixture into a steam reforming reaction zone containing a catalyst composition consisting essentially of (A) a nickel-magnesia component in which the atomic ratio of Ni/Mg is in the range of 0.05 to 7.0 and which contains a solid solution consisting of nickel oxide and magnesia, (B) a member selected from the group consisting of a copper-chromium mixture in oxide form and a copper-chromium-manganese mixture in oxide form, the amount of component (B) being from 10 to 25 wt. % based on the nickel content, calculated as the metal, of component (A), and (C) up to 70 percent by weight, based on the combined weights of (A), (B) and (C), of a carrier substance selected from the group consisting of α-Al_2O_3, SiC, α-quartz and calcined ZrO_2, said catalyst composition having been calcined at a temperature in the range of 350° to 1200° C and effective to form said solid solution, and effecting steam reforming of said feed hydrocarbons by maintaining the temperature of the said catalyst in the range of 300° to 600° C and the pressure of the reaction zone being in the range of 10 to 100 kg/cm² G.

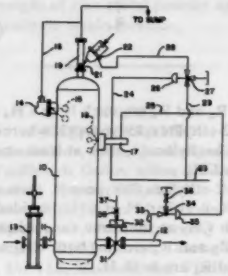
4,000,989

METHOD AND APPARATUS FOR ELIMINATING AIR FROM LIQUID FLOW STREAMS

Ronald G. Dunegan, Katy, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed Nov. 24, 1975, Ser. No. 634,781
Int. Cl.² B01D *19/00*
U.S. Cl. 55—18 **6 Claims**

1. A method for removing entrained free air or other gas from liquid flowing through piping at pressures above atmospheric, the piping having a closed tank interposed between inflow and outflow portions of the piping, the steps comprising causing liquid from the inlet portion normally to flow continuously into and through the tank and from the lower portion of the tank to the outer portion, maintaining a body of liquid within the tank which directly receives liquid from the inflow piping portion and from which liquid directly flows to the outflow piping portion, collecting and confining free air or other gases separating from the liquid in the tank in the upper portion thereof above the liquid level in the tank, thereby



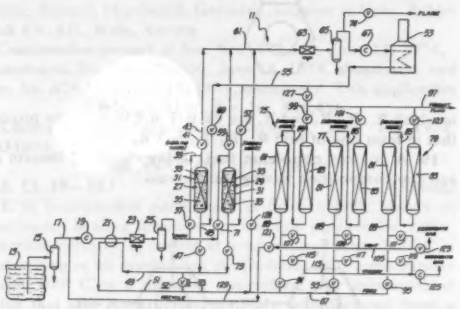
causing the collected air or other gas to be maintained at a pressure which is substantially equal to the pressure of the liquid body, liquid being discharged through the outflow portion of the piping by the pressure of the liquid body within the tank, and effecting controlled venting of air from the upper portion of the tank to maintain the liquid level in the tank between upper and lower limits.

4,000,990

ADSORPTION PROCESS

Larry A. Bingham, Mission Viejo, Calif., assignor to NRG Nufuel Company, Phoenix, Ariz. and Reserve Synthetic Fuels, Inc., Newport Beach, Calif., part interest to each

Filed Apr. 16, 1975, Ser. No. 568,668
Int. Cl.² B01D *53/04*
U.S. Cl. 55—30 **22 Claims**



1. A process for purifying a fluid stream which includes an impurity and a product fluid, said process comprising:

providing at least three adsorption zones each of which has an inlet and an outlet, each of the adsorption zones including adsorbent material capable of selectively adsorbing the impurity from the fluid stream;

introducing the fluid stream into the inlet of the first of said adsorption zones and contacting the fluid stream with the adsorbent material of the first adsorption zone at a first pressure to thereby adsorb the impurity in the adsorbent material and provide product fluid;

discharging the product fluid from the outlet of said first adsorption zone during first and second periods;

reducing the pressure in a second of the adsorption zones during the first period to a second pressure which is less than said first pressure, said second adsorption zone having previously been used for adsorption of the impurity from the fluid stream;

reducing the pressure in the second adsorption zone during at least a portion of the second period to a third pressure which is less than said second pressure and which is less than atmospheric pressure to desirb at least some of the impurity from the second adsorption zone;

providing a pressure in a third of the adsorption zones during at least a portion of the first period which is less than said second pressure and which is less than atmospheric pressure to desorb at leastsome of the impurity from the third adsorption zone, said third adsorption zone having previously had the pressure therein reduced to about the second pressure;

repressurizing the third adsorption zone during at least a portion of the second period;

terminating the inroduction of the fluid stream into the inlet of said first adsorption zone and the repressurization of said third adsorption zone;

introducing the fluid stream into the inlet of the third adsorption zone to adsorb the impurity in the adsorbent material of the third adsorption zone and to provide product fluid;

discharging the product fluid from the outlet of said third adsorption zone during a third period; and

maintaining the presure in said second adsorption zone below atmospheric pressure during at least a portion of the third period to desorb some of the impurity from the third adsorption zone during the third period.

4,000,991

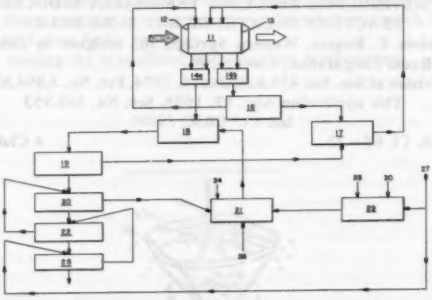
METHOD OF REMOVING FLY ASH PARTICULATES FROM FLUE GASES IN A CLOSED-LOOP WET SCRUBBING SYSTEM

Deering D. Melin, Jr., Palo Alto, and Donald F. Grieve, La Honda, both of Calif., assignors to Krebs Engineers, Menlo Park, Calif.

Continuation-in-part of Ser. No. 562,553, March 27, 1975, abandoned. This application Dec. 5, 1975, Ser. No. 638,182

Int. Cl.² B01D *47/06*

U.S. Cl. 55—48 **14 Claims**



1. In the process of removing fly ash particulates suspended in a flue gas stream utilizing at least one wet scrubber in a closed-loop system, the steps of

a. contacting the gas stream in a scrubbing zone of the scrubber with an aqueous scrubbing solution to wet and collect the fly ash, said scrubbing solution containing an inert diluent comprising a soluble alkali metal salt having an anion which is unreactive with sulfur oxides,

b. removing said contacted scrubbing solution from the scrubbing zone at a pH level of at least 6.0,

c. separating the entrained fly ash from the scrubber effluent solution and disposing of the separated fly ash, and

d. recycling the separated scrubbing solution and inert diluent as a make-up solution to the scrubbing zone.

4,000,992

DUST SUPPRESSION WITH SMALL BUBBLE FOAM IN CYCLONE

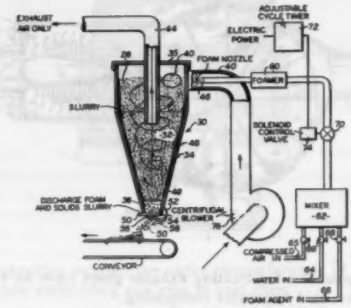
Howard W. Cole, Jr., 12 Vale Drive, Mountain Lakes, N.J. 07046

Filed Nov. 27, 1974, Ser. No. 527,812

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² B01D *47/00*

U.S. Cl. 55—87 **9 Claims**



1. The method of separating very small particulate matter from a gas stream which comprises directing a stream of gas that contains the particulate matter, into a separation chamber of a cyclone separator, discharging into the chamber a small bubble foam, with bubbles of an average size less than 0.015 inch in diameter, to mix with the gas stream and move along the sides of the chamber, trapping the particulate matter from the gas stream in the foam to form a slurry, draining the slurry down the side wall of the separation chamber, and discharging the slurry from the lower part of the chamber.

4,000,993

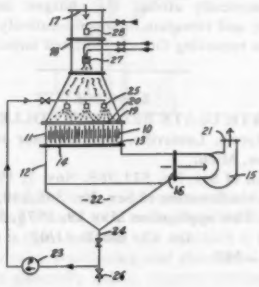
PROCESS FOR SCRUBBING GAS STREAMS

Richard Adolf Holl, St. Catharines, Canada, assignor to Micron Engineering Inc., St. Catharines, Canada

Filed Nov. 10, 1975, Ser. No. 630,713

Int. Cl.² B01D *47/06*

U.S. Cl. 55—94 **38 Claims**



1. A process for the diffusiophoretic scrubbing of a carrier gas stream to remove contaminant material therefrom including the step of discharging into the gas stream a scrubbing material consisting of hydrogen chloride, and thereafter passing the carrier gas stream and entrained scrubbing and contaminant materials through a space in which the gas stream is scrubbed with an aqueous scrubbing liquid such that diffusiophoretic absorption of the scrubbing material into the aqueous scrubbing liquid takes place to scrub the contaminant material from the gas stream.

4,000,994

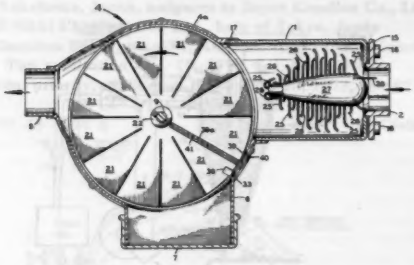
ELECTROSTATIC PRECIPITATION APPARATUS FOR VEHICLE ENGINE EXHAUST

Joseph Youhouse, 11941 SW. 43rd St., Miami, Fla. 33175

Continuation-in-part of Ser. No. 436,134, Jan. 24, 1974, abandoned. This application Feb. 10, 1975, Ser. No. 548,511

Int. Cl.² B03C *3/16*

U.S. Cl. 55—112 **6 Claims**



1. An apparatus for treating exhaust gases from an engine exhaust line, said apparatus comprising:

a first housing chamber having an inlet for attachment to said exhaust line and an outlet spaced from said inlet; convoluted coil means inside said first chamber having successive convolutions thereof spaced apart along the flow path through said first chamber from said inlet to said outlet, terminals for applying to said coil means a high DC voltage for charging impurities in the exhaust flowing past;

said first chamber having an open cross-sectional area which is substantially larger than that of the engine exhaust line, whereby to reduce the velocity of the exhaust as it flows past said coil means;

a second housing chamber having an inlet connected directly to the outlet of said first chamber and having an outlet spaced from said last-mentioned inlet;

a plurality of discs positioned in said second chamber with the plane of each disc extending substantially in the direction of the exhaust flow through said second chamber from said second chamber inlet to said second chamber outlet, said discs being at an electrical potential substantially different from that of said coil means whereby to electrostatically attract the charged impurities in the exhaust; and vibration means operatively coupled to said discs for removing the accumulated impurities therefrom.

4,000,995

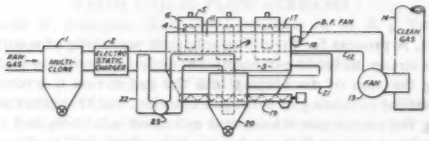
PARTICULATE BED DUST COLLECTORS

John M. Morris, Louisville, Ky., assignor to Rexnord Inc., Milwaukee, Mich.

Continuation of Ser. No. 521,765, Nov. 7, 1974, abandoned, which is a continuation of Ser. No. 366,140, June 1, 1973, abandoned. This application May 19, 1975, Ser. No. 578,518

Int. Cl.² B01D *41/02*

U.S. Cl. 55—282 **4 Claims**



3. In a dust collecting system, in combination, a plenum chamber, a dirty gas inlet at one end of said plenum chamber, a solids removal means at the bottom of the chamber, a plurality of filter bed modules connected to the plenum chamber to receive dirty gas from the chamber and to discharge backflush gas and collected dust to the chamber, and auxiliary means for extracting dust from the plenum chamber comprising a cyclone having its tangential inlet connected to the plenum chamber at a location remote from the dirty gas inlet and having its discharge connected through a fan to the dirty gas inlet to the plenum chamber.

4,000,996

REFRIGERATING PACKAGE

George Jordan, Fairfield, Conn., assignor to Hospital Marketing Services Co., Inc., Fairfield, Conn.

Filed Nov. 7, 1975, Ser. No. 630,042

Int. Cl.² F25D *5/00*

U.S. Cl. 62—4 **4 Claims**

1. A refrigerating package of a multicompartment construction formed of a single sheet of flexible plastic material, said single sheet of material being folded along the middle and sealed along the two coincidental edges opposite the fold to form a cylindrical plastic tube, one end of said tube being sealed closed, said sealed closed end being folded inwardly into said tube to form a compartmental gusset chamber having an open mouth, said gusset compartment being formed within the resulting outer compartment, a liquid placed within said gusset compartment, said gusset compartment being sealed at its said open mouth, a refrigerating chemical supplied to said outer compartment through its open end thereof, said outer compartment being sealed at said open end to enclose said refrigerating chemical and form said multicompartmented package, said gusset compartment being ruptured by pressure applied thereto enabling said liquid and refrigerating chemical to mix.

4,000,997

METHOD FOR REDUCING THERMALLY INDUCED FRACTURE IN CATHODE RAY TUBE BULBS

Melvin F. Rogers, Western Springs, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 430,828, Jan. 4, 1974, Pat. No. 3,894,858. This application Apr. 17, 1975, Ser. No. 568,953

Int. Cl.² C03C *19/00*

U.S. Cl. 65—23 **4 Claims**

1. In the processing of television cathode ray tubes wherein a cathode ray tube glass bulb or glass bulb component having a visual defect on an exterior surface of said component, said component being subjected to a predetermined high temperature, and subsequently cooled thus establishing, during a period of cooling, a temperature gradient between (i) a relatively rapidly cooling exterior surface area of the glass bulb component and (ii) a more slowly cooling interior portion of the glass bulb component, whereby thermally induced tensile

forces are created at the glass surface by the temperature gradient, a method for reducing such tensile forces in the vicinity of said visual glass surface defect on the glass bulb component to lessen the likelihood of fracture of the glass bulb component at the visual defect, said method comprising locally reducing in the vicinity of said visual defect during said cooling period the temperature gradient between said relatively rapidly cooling exterior surface area and said more slowly cooling interior portion of the glass bulb component by applying prior to or during said cooling period a thermal insulator over the visual glass surface defect and its vicinity.

4,000,998

SPONTANEOUSLY-FORMED NEPHELINE-CARNEGIEITE GLASS-CERAMICS

Hermann L. Rittler, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,730

Int. Cl.² C03B *32/00;* **C03C** *3/22*

U.S. Cl. 65—33 **4 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of carnegieite and/or nepheline solid solution dispersed within a glassy matrix, said crystals comprising at least 50% by volume of said article, which comprises the steps of:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 14–64% Na_2O, 8–50% Al_2O_3, and 26–65% SiO_2;

b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 850°–1050° C. to shape said melt into a glass body and obtain a phase separation and nucleation therein;

c. further cooling said shaped glass body and exposing said glass body to a temperature between about 650°–850° C. for a sufficient length of time to cause crystallization of the carnegieite and/or nepheline solid solution crystals in said glass body; and then

d. cooling the crystallized body to room temperature.

4,000,999

CENTRIFUGALLY CASTING HOLLOW GLASS BODY AROUND VAPOR SHIELD

John R. Lucek, and Vernon B. Palen, both of Pittsfield, Mass., assignors to General Electric Company, N.Y.

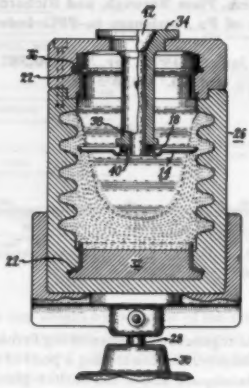
Division of Ser. No. 427,517, Dec. 27, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 517,858

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C03B *9/00, 7/00;* **C03C** *27/02*

U.S. Cl. 65—49 **4 Claims**

1. A method of embedding a support ring in a vacuum envelope comprising a centrifugal mold, a ring member having an internal welding flange, a cap for said mold, said cap being provided with a ring holding means extending into said mold, said ring holding means holding said support ring within said mold, charging said mold with a predetermined quantity of glass, and rotating said mold to form a glass envelope said



glass extending beyond the outer circumference of said ring and firmly embedding said ring in said glass.

4,001,000

METHOD OF MANUFACTURING A PERCUSSION FLASHLAMP

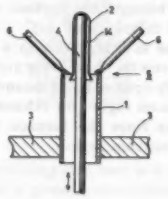
Bauke Jacob Roelevink, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 446,232, March 29, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,728

Claims priority, application Netherlands, Apr. 17, 1973, 7305332

Int. Cl.² C03C *27/02*

U.S. Cl. 65—59 A **2 Claims**

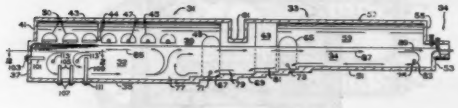


1. A method of manufacturing a percussion flashlamp which comprises: providing a metal tube having a cylindrical section, one end of which is open and one end of which is closed and a cylindrical glass tube, positioning said glass tube relative to said metal tube in generally axially aligned relationship with an axial section of each in concentric relationship, holding said relationships with at least one holding member which includes an elongated pin, said positioning step including positioning said pin in generally coaxial relationship to each of said tubes and, radially spaced from the interior of all of said cylindrical section of said metal tube with an axial extremity of said pin engaging only said closed end of said metal tube, said metal tube being held on said pin only by gravity, sealing said glass tube to said metal tube by heating, and withdrawing said metal pin from said metal tube, said tubes being radially spaced to avoid conduction of heat away from the area where said glass and metal tubes are joined.

4,001,001
HORIZONTAL GLASSMAKING FURNACE

Leonard A. Knavish, Plum Borough, and Richard L. Cerutti, Seminole, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 19, 1976, Ser. No. 650,387
Int. Cl.² C03B 5/02
U.S. Cl. 65—337 3 Claims



1. In a side-fired regenerative glassmaking furnace comprising an enclosed chamber for containing a pool of melted glass and providing a headspace above the molten glass; the chamber having a bottom, side walls, a front wall, a back wall and a roof; further having, in the vicinity of said back wall, means for charging glass batch materials into said furnace; further having, in the vicinity of said front wall, means for discharging molten glass from said furnace; and further having means for supplying heat to at least a portion of said furnace for melting glass batch materials forming molten glass therefrom; said heating means comprising at least five firing ports extending outwardly from each side of the furnace and connected to regenerators; wherein a portion of said furnace is for advancing glass batch materials floating on molten glass in a general direction away from said back wall and toward said front wall while melting said floating glass batch materials, the improvement comprising

dampering means substantially blocking each of the first and second ports of the furnace providing a substantially enclosed headspace in the region of the first and second ports isolated from the regenerators of the furnace;

submerged electrode means for applying heat to molten glass contained in the furnace only in a region lying between the side walls of the furnace and extending along the length of the furnace from its back wall to a region between its third firing ports and within a bottom portion of the furnace beneath the surface of a pool of molten glass contained therein; and

combustion means in firing ports in a downstream region extending between the third firing ports and the front wall and substantially open exhaust means through firing ports in said downstream region for exhausting substantially all exhausted gases from the furnace to the regenerators from said downstream region.

4,001,002
METHOD OF PROMOTING FLOWERING IN FRUIT PLANTS

Ramon C. Barba, 428 Anos St., Los Banos, Laguna, Philippines

Filed Sept. 11, 1974, Ser. No. 504,948
Claims priority, application Philippines, July 3, 1974, 16014
Int. Cl.² A01N 5/00
U.S. Cl. 71—65 12 Claims

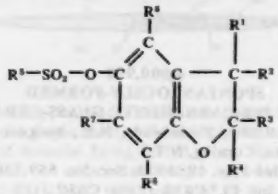
1. A method of inducing flowering in a fruit plant which comprises applying a flowering inducing amount of potassium nitrate, sodium nitrate, calcium nitrate, magnesium nitrate, barium nitrate, ammonium nitrate or nitric acid to a fruit plant.

4,001,003
PLANT PHYSIOLOGICALLY ACTIVE COMPOSITIONS CONTAINING 2-HALO-2,3-DIHYDROBENZOFURAN-5-OLESTERS OF SULFONIC ACIDS AND METHODS OF USE

Peter Stuart Gates, Cambridge, England, assignor to Fisons Limited, London, England

Division of Ser. No. 460,150, April 11, 1974, Pat. No. 3,896,151. This application Apr. 16, 1975, Ser. No. 568,582
Claims priority, application United Kingdom, Apr. 17, 1973, 18395/73
Int. Cl.² A01N 9/00
U.S. Cl. 71—88 29 Claims

1. A plant physiologically active composition consisting essentially of an effective herbicidal or plant gowth regulating amount of a compound of the formula:



in which R^1, R^2 and R^3 are the same or different and each represents hydrogen or alkyl of 1–6 carbon atoms, or R^1 and R^2 together or R^2 and R^3 together form an alkylene chain of 2–5 carbon atoms;

R^4 represents a halogen atom;

R^5 represents alkyl of 1–4 carbon atoms, alkyl of 1–4 carbon atoms substituted by halogen or alkoxy of 1–6 carbon atoms, phenyl or phenyl substituted by halogen or alkyl of 1–4 carbon atoms; and

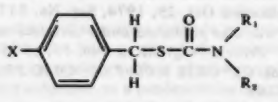
R^6, R^7 and R^8 are the same or different and each represents hydrogen, alkyl of 1–4 carbon atoms, halogen, cyano, alkanoyl of 2–6 carbon atoms or alkoxy of 1–4 carbon atoms, together with at least one material selected from the group consisting of carriers, surface active agents, pesticides and other plant growth regulants.

4,001,004
SYNERGISTIC HERBICIDAL COMPOSITION FOR PADDY FIELDS

Teruhiko Toyama, Fugisawa, and Yoshio Takasawa, Chigasaki, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sept. 18, 1972, Ser. No. 290,002
Int. Cl.² A01N 9/12
U.S. Cl. 71—100 7 Claims

1. A herbicidal composition for use in paddy fields consisting essentially of a herbicidally effective amount of a mixture of α-(β-naphthoxy)-propionanilide and a synergistic proportion of a compound having the general formula



wherein X represents Cl, F, CH_3, C_2H_5, n-C_3H_7, iso-C_3H_7, tert-$_4H_9$, OCH_3 or SCH_3 and R_1 and R_2 each represent C_2H_5, and an inert carrier, the ratio of said α-(β-naphthoxy)-propionanilide to said compound being 1–2:1–4.

4,001,005

HERBICIDAL COMPOSITIONS COMPRISING HALOPHENOXY BENZOIC ACID ESTERS

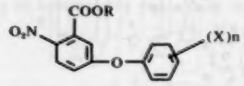
Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 477,233, June 7, 1974, Pat. No. 3,907,866. This application May 12, 1975, Ser. No. 576,770

Int. Cl.² A01N 9/24

U.S. Cl. 71—108 **7 Claims**

1. A herbicidal composition comprising a carrier and a herbicidal amount of a compound having the formula:



wherein X is halogen, *n* is 1 to 3, and R is alkyl (C_4–C_{12}), cycloalkyl (C_5–C_8), or unsaturated hydrocarbyl (C_5–C_{10}).

4,001,006

DIALKYLAMMONIUM-2,4-DICHLOROPHENOXYACETATES AS PLANT GROWTH REGULATORS AND THE METHOD OF MAKING SAME

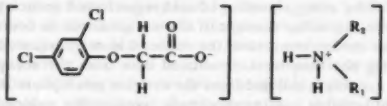
Lawrence H. Nash, Fort Lauderdale, Fla., assignor to Kalo Laboratories, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 179,333, Sept. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 33,078, April 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 4,087, Jan. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 700,967, Jan. 26, 1968, abandoned. This application June 26, 1975, Ser. No. 590,518

Int. Cl.² A01N 9/24; C07C 53/16

U.S. Cl. 71—117 **28 Claims**

1. A compound of the formula



wherein R_1 and R_2 are identical radicals selected from the group consisting of methyl and ethyl, (a) when said R_1 and R_2 are both methyl, said compound has an infra-red spectra according to FIG. 2 and a melting point from about 92.8° to 93.4° C., and (b) when said R_1 and R_2 are both ethyl, said compound has an infra-red spectra according to FIG. 4 and a melting point of about 48° C.

4,001,007

MATERIAL FOR SINTERING EMITTING A LESSER AMOUNT OF NITROGEN OXIDE AND A METHOD FOR MANUFACTURING THE SAME

Minoru Sasaki, Yokohama; Yukihiro Hida; Tsuneo Enokido, both of Kawasaki, and Kaoru Ito, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

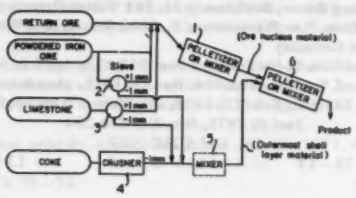
Filed Dec. 30, 1974, Ser. No. 537,533

Claims priority, application Japan, Dec. 31, 1973, 49-3869; Dec. 31, 1973, 49-3870; Dec. 31, 1973, 49-3871; Jan. 24, 1974, 49-9770; Jan. 25, 1974, 49-10209

Int. Cl.² C22B 1/16, 1/24

U.S. Cl. 75—5 **3 Claims**

1. A pellet for preparing a sintered ore for use in iron making operations, said pellet comprising a core layer of materials selected from the group consisting of iron ore, fines and limestone, there being no coke present in said core layer, and an outer layer of materials selected from the group consisting of iron ore, fines, limestone and coke, said core layer materials having a particle size of between 1 and 10 mm, the concentration of the coke in said outer layer satisfying the following formula:



$$40 \geq C \geq \frac{a}{(100-b)} \times 100$$

wherein *a* is the weight by per cent of the coke in the pellet; *b* is the weight by per cent of particles having a size of at least 1 mm in the pellet; and *c* is the concentration percentage of the coke in the outer layer.

4,001,008

METHOD AND APPARATUS FOR THE REDUCTION OF ORES, ESPECIALLY IRON ORES

Kurt Stift, Leoben, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Austria

Continuation of Ser. No. 495,184, Aug. 6, 1974, abandoned, which is a continuation of Ser. No. 305,085, Nov. 9, 1972, abandoned, which is a continuation of Ser. No. 90,177, Oct. 8, 1970, abandoned. This application Oct. 1, 1975, Ser. No. 618,675

Int. Cl.² C21C 5/52

U.S. Cl. 75—11 **5 Claims**

1. A method of reducing iron ores in a shaft furnace having an upper portion of a given cross-sectional area joined to a lowermost portion of enlarged cross-sectional area, and having an iron bath therein, by an intermediate portion of reduced cross-sectional area, said method comprising the steps of

a. introducing a descending burden comprising iron ores in the upper portion of the shaft furnace without addition of fuel so that upon descent of the burden no carbon is generated,

b. producing hot reducing gases through partial combustion of hydrocarbons outside said furnace,

c. introducing said hot reducing gases and carbon in powder form carried by at least a portion of said hot reducing gases into said lowermost furnace portion in a generally downward direction toward said iron bath said hot reducing gases flow toward the descending burden and effect reduction, and

d. supplying to the lower portion of said furnace additional heat produced by electric energy.

4,001,009

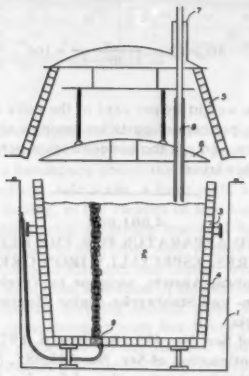
PROCESS FOR THE MANUFACTURE OF STEELS WITH A HIGH CHROMIUM CONTENT

Hannsgeorg Bauer, Buchenweg 21, 581 Witten-Bommern, and Josef Otto, Am Wasserturm 5, 5802 Wetter 4 - Wengern, both of Germany

Continuation-in-part of Ser. Nos. 840,073, April 3, 1969, abandoned, Ser. No. 195,424, Nov. 3, 1971, abandoned, and Ser. No. 331,541, Feb. 12, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,204

Int. Cl.[2] C21C *5/52*

U.S. Cl. 75—13 13 Claims



1. In a method of making stainless steel, the steps of

melting solid charge material, including stainless steel scrap under substantially atmospheric pressure and environmental conditions whereby, upon completion of melting, a molten charge is obtained,

pouring said molten charge, including the melted solid charge material obtained in the preceding step, into a treatment vessel having sufficient freeboard to contain the violent disruption of the upper exposed surface of the molten charge which is thereafter induced,

said molten charge having about 10–35% Cr, and C in an amount substantially greater than the final desired amount,

adding oxygen to the aforesaid molten charge to supersaturate the charge with oxygen,

exhausting the atmosphere above the surface of the molten charge to thereby subject the upper, exposed surface of the molten charge to a vacuum,

subjecting the molten charge to an absolute pressure of a magnitude which causes the $C + O = CO$ reaction to be preferential to the $3Cr + 4O = Cr_3O_4$ reaction down to and including the desired carbon level,

continuously violently disrupting the upper, exposed surface of the molten charge which is subject to the aforesaid low absolute pressure,

continuously replenishing the violently disrupted surface by vigorously circulating molten metal remote from the surface to the violently disrupted surface by admission of a stirring gas to the lower region of the vessel, and

maintaining said violent surface disruption and vigorous internal circulation during the time the molten charge is exposed to the vacumm which causes the $C + O = CO$ reaction to be preferential to the $3Cr + 4O = Cr_3O_4$ reaction.

4,001,010

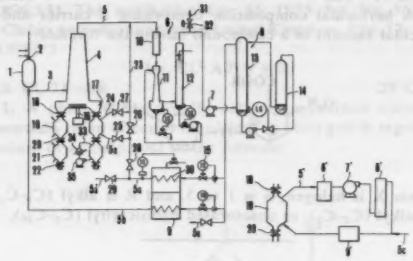
METHOD FOR PROCESSING REDUCED IRON

Kenjiro Kanbara; Masayuki Hattori; Satoru Miyasita; Masaaki Iguchi, and Jihei Yoda, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,684

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—35 4 Claims



1. In a method for processing reduced iron in which granular iron oxide charged into a vertical furnace is reduced by a reducing gas comprising carbon monoxide, hydrogen, carbon dioxide, water and hydrogen sulfide, and a substantial part of the waste gas containing carbon dioxide, water and hydrogen sulfide resulting from the reducing process is regenerated for the reuse thereof by the removal of carbon dioxide, water and hydrogen sulfide, the improvement which comprises the steps of discharging said reduced iron having been reduced by the gas reduction in the vertical furnace and under isolation from the exterior atmosphere, said reduced iron containing sulfur and carbon, into an airtight sealable component adjusting receptacle, subjecting the reduced iron to desulfurization and carburization in said receptacle at a temperature of 700° to 1100° C by using a portion of said regenerated reducing gas, whereby the sulfur content of the reduced iron is decreased and the carbon content of the reduced iron is increased, discharging the thus treated reduced iron from the receptacle while keeping it isolated from the exterior atmosphere into an airtight sealable cooling receptacle, cooling the reduced iron in said cooling receptacle and thereafter discharging the thus cooled reduced iron from said cooling receptacle.

4,001,011

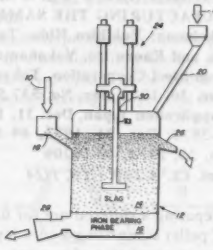
PYROMETALLURGICAL RECOVERY OF IRON FROM IRON SILICATE SLAGS

Jagdish C. Agarwal, Concord; Paul R. Ammann, Boxford, and Jonathan J. Kim, Chelmsford, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,727

Int. Cl.[2] C21B *11/00*

U.S. Cl. 75—40 4 Claims



1. A process for extracting iron from slag comprising the steps of:

a. introducing the slag into a reactor;
b. maintaining a CaO/SiO_2 ratio in the range of 2.0–3.3 in slag in the reactor;
c. maintaining the temperature of the slag in the reactor at a level at which the slag is molten;
d. adding a solid carbonaceous reductant to the molten slag in the reactor at a rate sufficient to reduce FeO in said slag;
e. mixing said reductant into the molten slag in the reactor with an internally cooled, metal bladed, rotating stirrer driven at a rate sufficient to pump said reductant into the slag to enhance said reduction of FeO; and,
f. separating an iron bearing phase from the slag.

4,001,012

METHOD OF PRODUCING STAINLESS STEEL

Franklin E. Rote, Homewood, Ill., and Raymond C. Stephan, Gary, Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 28, 1973, Ser. No. 419,753
Int. Cl.² C21C *5/34*
U.S. Cl. 75—51 **17 Claims**

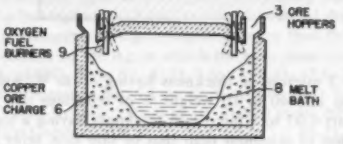
1. A process for producing a chromium-containing steel the steps comprising:
a. forming a steelmaking heat by charging into a refractory-lined steelmaking vessel a charge comprising molten iron containing at least carbon, silicon and phosphorus as impurities, and solid steel scrap in amounts up to about 30 to 35% by weight of total charged metallics;
b. adding a first basic slag-forming flux to the heat and subjecting the heat to a first blowing step in which oxygen is blown for a time sufficient to melt said solid steel scrap and to reduce the phosphorus content of the heat to below about 0.03% by oxidation thereof, and to oxidize a substantial portion of the other impurities, and to provide a first basic fluid slag having a fluid V-ratio of from about 1.5 to 8.0;
c. removing substantially all of said first fluid slag from the heat;
d. adding sufficient chromium-bearing material selected from the group consisting of ferrochromium, chromium containing scrap and mixtures thereof to the deslagged charge to provide approximately the final desired chromium content;
e. subjecting the heat to a second blowing step in which oxygen is injected through the vessel and into the heat below the surface thereof and substantially at the surface of the vessel refractory lining while simultaneously injecting a hydrocarbon-containing protective jacket fluid surrounding the injected oxygen, thereby melting the chromium bearing material;
f. adding a second basic slag-forming flux to the chromium-containing heat to form a second basic fluid slag while continuing the second blowing step until the carbon content of the heat is reduced to the final desired level;
g. blowing an inert gas through the heat to remove dissolved reaction and process gases from the heat, while adding sufficient ferrosilicon to the heat to reduce oxidized chromium from the slag; and
h. thereafter tapping the heat.

4,001,013

METHOD OF OPERATING COPPER ORE SMELTING REVERBERATORY FURNACE

Motoo Goto; Minoru Fujiwara, and Makoto Ishikawa, all of Iwaki, Japan, assignors to Onahama Seiren Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 445,335, Feb. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 264,060, June 19, 1972, abandoned. This application Sept. 29, 1975, Ser. No. 617,843
Claims priority, application Japan, July 23, 1971, 46-54656
Int. Cl.² C22B *15/00*
U.S. Cl. 75—72 **6 Claims**



1. In a method of operating a reverberatory furnace for smelting copper containing ores having a relatively large proportion of sulfur therein, the furnace having a main body with long refractory side walls and transverse refractory end walls, the main body containing a melted bath of matte and slag layer overlying the matte, the furnace having a roof covering the main body with a plurality of hoppers opening through the roof along the side walls or closely adjacent thereto for wet charging the starting material copper ore into ore piles along the side walls below the hoppers, one end wall having main burner means therein for directing combustion flames in a substantially horizontal direction over the melt bath, the furnace having an exit for the matte, an exit for the slag and an exit for the waste gas containing sulfur dioxide produced during operation of the furnace, the last mentioned exit being adapted to be coupled to a sulfur dioxide recovery system, the improvement comprising inserting at least one oxygen fuel burner through the roof of the furnace directed downwardly toward the ore piles and feeding a mixture consisting essentially of oxygen and hydrocarbon fuel through said burner with the oxygen being present in the mixture in an amount of from 100 to 150% of the theoretical amount for burning the fuel, said mixture being fed under feed conditions which cause the tip of the combustion flame from said burner just to reach the surface of said ore piles, and maintaining the oxygen partial pressure within said reverberatory furnace measured at said exit for the waste gas within the range of about 3 to 5.5 mm Hg-absolute, whereby latent heat due to CO and H_2 produced in the products of combustion in the furnace is utilized so as to increase the rate at which the ore can be smelted, thereby increasing production in the furnace, to reduce the amount of fuel necessary per unit weight of smelted ore, and to increase the concentration of sulfur dioxide in the waste gas so as to make more economical the recovery of the sulfur dioxide.

4,001,014

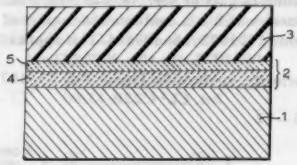
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE PLATE HAVING TELLURIUM PRESENT IN VARYING CONCENTRATIONS ACROSS ITS THICKNESS

Eiji Ando, Katano, and Yoshiki Hayashi, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 12, 1974, Ser. No. 505,497
Claims priority, application Japan, Sept. 17, 1973, 48-105269; Oct. 19, 1973, 48-118200
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 **14 Claims**

1. An electrophotographic photosensitive plate comprising, in order from the bottom up, an electrically conducting sub-

strate, a photosensitizing layer comprising vitreous selenium and tellurium and having a thickness of 0.1 to 3 microns, and a top layer comprising a member selected from the group consisting of polyvinylcarbazole and derivatives thereof, said photosensitizing layer being composed of a first layer part



0.05 to 2 microns in thickness having 60 to 90 weight % of selenium and 40 to 10 weight % of tellurium and a second layer part 0.05 to 1 micron in thickness having a higher concentration of selenium than that of said first layer part, and said second layer part being positioned between said first layer part and said top layer.

4,001,015

METHOD FOR THE PRODUCTION OF PRINTING PLATES USING PHOTOSENSITIVE COMPOSITIONS

Helmut Barzynski, Lambsheim, and Peter Richter, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 182,873, Sept. 22, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 437,894

Claims priority, application Germany, Oct. 9, 1970, 2049621

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² G03C *1/70*; **G03F** *7/08*

U.S. Cl. 96—33 **4 Claims**

1. A process for the production of printing plates using a photosensitive composition consisting essentially of an intimate blend of

A. 40 to 97% by weight, with reference to the whole blend A + B, of a mixture of

A.1. 15 to 80% by weight, with reference to A, of a water-soluble linear N-vinylpyrrolidone polymer having a molecular weight of at least 1000, and

A.2. 20 to 85% by weight, with reference to A, of a polymer or copolymer of an olefinically unsaturated carboxylic acid having 3–6 carbon atoms which is soluble or swellable in water or aqueous alkali and has a molecular weight of at least 500, the content of carboxyl groups therein being at least 5% by weight based on the polymeric polycarboxylic acid, and

B. 3 to 60% by weight, with reference to the whole blend A + B, of olefinically unsaturated monomers which are compatible with mixture A (A.1 + A.2), which do not boil below 100°C at atmospheric pressure, and of which the portion having more than one photo polymerizable olefinically unsaturated double bond predominates,

which comprises applying a thin layer of said composition to supports and exposing said layer through an at least partially transparent negative or positive without subsequent development processing.

4,001,016

POLYMERS WHICH CAN BE CROSS-LINKED BY PHOTOPOLYMERIZATION

Hans-Jurgen Rosenkranz, Krefeld; Hans Rudolph, Krefeld-Bochum; Erich Wolff, and Harald von Rintelen, both of Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation-in-part of Ser. No. 256,162, May 23, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,873

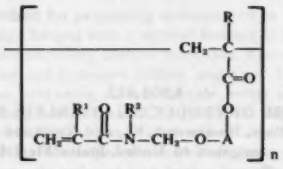
Claims priority, application Germany, May 25, 1971, 2125910

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² G03C *5/00*, *1/68*

U.S. Cl. 96—35.1 **2 Claims**

1. A process for the production of photographic relief images or photoresists comprising the steps of imagewise exposing a supported light-sensitive material with a photocrosslinkable polymer in the layer, washing away the unexposed areas of the photosensitive layer to form a relief image of photocrosslinked polymeric material the improvement wherein the said photocrosslinkable polymer compound is a photopolymer of recurrent units of the general formula



wherein

R stands for hydrogen or alkyl having up to 4 carbon atoms and

R^1 represents hydrogen or alkyl having up to 4 carbon atoms,

R^2 stands for hydrogen or alkyl having up to 8 carbon atoms, and

A represents a divalent aliphatic bridging member having 2-4 carbon atoms or a bridging member of the formula $-(CH_2-CH_2-O)_m-CH_2-CH_2-$

wherein m represents an integer of 1 to 3,

n is 2 or more,

wherein the photopolymer is either a homopolymer or a copolymer with comonomers selected from the group consisting of vinyl monomers, vinyl esters, vinyl ethers, acrylic and methacrylic acid and their derivatives, maleic acid anhydride, and styrene and the light-sensitive polymer has an average molecular weight of between 10,000 and 100,000.

4,001,017

PROCESS FOR THE PHOTOPOLYMERIZATION OF ETHYLENICALLY UNSATURATED COMPOUNDS

Niklaus Baumann, Fribourg, and Hans-Peter Schlunke, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 29, 1973, Ser. No. 420,176

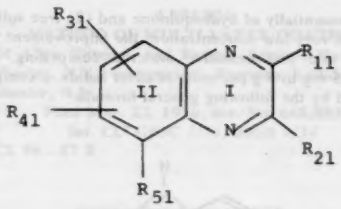
Claims priority, application Switzerland, Dec. 5, 1972, 17658/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² G03C *1/70*

U.S. Cl. 96—35.1 **14 Claims**

1. Process for the photopolymerisation of ethylenically unsaturated monomers which contain terminal $H_2C=$ groups and are water-soluble with the aid of at least one photoredox pair, which comprises employing as redox pair, on the one hand, a diazine compound of the formula



wherein

R_{11} and R_{21} denote a phenyl radical, a benzoyl radical, a phenylsulphonic acid group a methyl group or a hydrogen atom, or

R_{11} and R_{21} together with two carbon atoms of the ring I denote a five-membered or six-membered heterocyclic and

R_{31}, R_{41} and R_{51} denote a hydrogen atom, or lower alkyl group, a chlorine atom, a nitro group, a primary amino group, an acylamino group, a trimethylammonium group, a carboxylic acid amide group which is not substituted further or is substituted further by one to two lower alkyl groups, a carboxylic acid group, carboxylic acid methyl ester group or carboxylic acid ethyl ester group or sulphonic acid group, or two of R_{31}, R_{41} and R_{51} together with two adjoining carbon atoms of the ring II denote an heterocyclic ring, and on the other hand, an electron donor, and using for the photopolymerisation a radiation which lies in the range of 200 to 450 nm.

4,001,018

METHOD FOR MAKING A STRIPE SCREEN ON A FACE PLATE OF A CATHODE RAY TUBE BY ROTATING CORRECTION LENS

Asahide Tsuneta, Kawasaki, and Shigeo Takenaka, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 477,281, June 7, 1974. This application Mar. 8, 1976, Ser. No. 664,863

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36.1 **3 Claims**

1. In the manufacture of a color cathode ray tube comprising an in-line arranged three beam electron gun assembly for emitting a central electron beam and a pair of side beams, a tricolor stripe screen formed on the inner surface of a face plate, and a shadow mask mounted in the face plate and having a plurality of slit apertures, a method for making the stripe screen comprising exposing a linear light source having a lengthwise direction coincident with that of the stripes to be formed on the screen through the shadow mask and a correction lens having a symmetrical axis, the correction lens being arranged between the linear light source and the shadow mask, and commonly using the correction lens and the linear light source at exposing steps corresponding to the central beam and to the side beams for making the stripe screen by arranging the correction lens so that the direction of the symmetrical axis of the correction lens at the exposing step corresponding to the central beam is aligned perpendicularly with the plane of the in-line arranged three beams and by arranging the correction lens so that the direction of the symmetrical axis of the correction lens at the exposing steps corresponding to the side beams is aligned with the plane of the inline arranged three beams.

4,001,019

REVERSIBLE LIGHT SENSITIVE GLASS

Toshiharu Yamashita, Hachioji, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 232,667, March 8, 1972, Pat. No. 3,833,511. This application Apr. 2, 1974, Ser. No. 457,304

Claims priority, application Japan, Apr. 2, 1973, 48-37708

The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² C03C *3/08*

U.S. Cl. 106—54 **1 Claim**

1. A reversible light sensitive glass comprising 100 weight parts of a base glass, 0.15 to 1.0 weight parts of Ag and an amount of halogen corresponding to or more than the chemical equivalence of the Ag, in which the base glass consists, in weight %, of SiO_2 48 to 62, Al_2O_3 7 to 15, B_2O_3 17 to 26, R_2O, where R represents Na, Li or K, 6 to 16, BaO 0.5 to 5, BaO/R_2O 0.05 to 0.40, TiO_2 0 to 10, ZrO_2 0 to 10, Nb_2O_5 0 to 5, $TiO_2+ZrO_2+Nb_2O_5$ 0.5 to 15, As_2O_3 0 to 2.0, Sb_2O_3 0 to 2.0 and $As_2O_3+Sb_2O_3$ <2.0.

4,001,020

DEVELOPING A SILVER HA1IDE EMULSION IN CONTACT WITH A HETEROCYCLIC THIONE AND A POLYALKYLENE OXIDE

Jun Hayashi; Akira Sato, and Tadao Shishido, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 230,493, Feb. 29, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,843

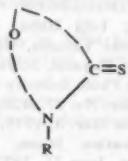
Claims priority, application Japan, Mar. 4, 1971, 46-11156; Mar. 4, 1971, 46-11157

Int. Cl.² G03C *5/20*

U.S. Cl. 96—66.3 **27 Claims**

1. In a method for obtaining photographic images of high sensitivity and high image sharpness by developing a silver halide photographic emulsion layer containing a latent silver image, the improvement which comprises developing said element with a developing agent selected from the group consisting of (a) a mixture of a polyhydroxybenzene and an N-alkylaminophenol, (b) a 1-phenyl-3-pyrazolidone and (c) a mixture of (a) and (b), and in contact with

1. an alkylene oxide polymer selected from the group consisting of polyalkylene glycols and condensation products of polyalkylene oxides with active hydrogen containing organic compounds, wherein the alkylene oxide chain of said alkylene polymer has a molecular weight of at least 300 and wherein said alkylene oxide units comprising said chain have from 2 to 4 carbon atoms, and
2. a heterocyclic compound not containing an unsubstituted N hetero atom represented by the general formula (I)



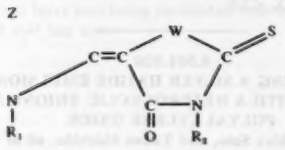
(I)

wherein Q represents the atoms necessary to form a heterocyclic ring selected from the group consisting of a thiazolidine-2-thione ring, an imidazolidine-2-thione ring, a selenazolidine-2-thione ring, a 1,3,4-thiadiazoline-2-thione ring, a 1,3,4-selenadiazoline-2-thione ring, a 4-thiazoline-2-thione ring, a 4-selenazoline-2-thione ring, and a 1,2-dihydropyridine-2-thione ring, said heterocyclic ring being unsubstituted or substituted on the atoms represented

by Q with an unsubstituted alkyl group, a hydroxyalkyl group, a haloalkyl group, an unsubstituted aryl group, an

alkylaryl group, a hydroxyaryl group, a haloaryl group, an alkylthio group, or an alkoxycarbonyl group; or Q represents the atoms necessary to form a heterocyclic ring selected from the group consisting of a benzothiazoline-2-thione ring, a benzoxazoline-2-thione ring, a benzimidazoline-2-thione ring, a benzselenazoline-2-thione ring and a 1,2-dihydroquinoline-2-thione ring, said heterocyclic ring being unsubstituted or substituted on the atoms represented by Q with an unsubstituted alkyl group, an unsubstituted aryl group, an aryl group substituted by halogen, alkyl or alkoxy, an aralkyl group, an alkoxy group, a halogen atom, a trimethylene group or a tetramethylene group; and wherein R is an unsubstituted alkyl group having from 1 to 10 carbon atoms, an alkyl group having from 2 to 10 carbon atoms and substituted by hydroxy, morpholino or aryl, an unsubstituted aryl group, an aryl group substituted by an alkyl group, an alkoxy group or a halogen atom, or R is a 2-pyridyl group, or represented by the general formula

(II)



wherein W is a sulfur atom, a selenium atom, an oxygen atom, or a >N—R_3 group, R_1, R_2 and R_3 each is an unsubstituted alkyl group, a substituted alkyl group wherein the substituent is carboxy or sulfo, and wherein Z represents the atoms required to form a heterocyclic ring selected from the group consisting of a benzothiazole ring, a naphthothiazole ring, a benzoxazole ring, a naphthoxazole ring, a benzoselenazole ring, a naphthoselenazole ring, an indolenine ring, a benzimidazole ring, a naphthimidazole ring, and a 2-quinoline ring, said heterocyclic ring being unsubstituded or substituted on the benzene ring with a halogen atom, a phenyl group, an unsubstituted alkyl group, an alkoxy group, or a hydroxy group, or substituted on the naphthalene ring with an alkoxy group; or Z represents the atoms required to form a heterocyclic ring selected from the group consisting of a thiazoline ring, a thiazole ring, an oxazole ring, a selenazole ring, and a 2-pyridine ring, said heterocyclic ring being unsubstituted or substituted on the atoms represented by Z with an unsubstituted alkyl or an unsubstituted aryl group.

4,001,021

LITHOGRAPHIC DEVELOPMENT OF A LITH-TYPE SILVER HALIDE EMULSIONS CONTAINING A BENZIMIDAZOLE

Tomio Nakajima, Tokyo; Teiji Habu, Kunitachi; Elichi Sakamoto, Hanno; Hiroshi Yamada, Hachioji; Katsuhide Mitsui, Hino, and Eisaku Hayashi, Shizuoka, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

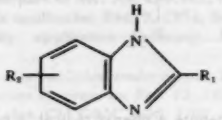
Continuation-in-part of Ser. No. 372,420, June 21, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,924

Claims priority, application Japan, June 30, 1972, 47-64958; United Kingdom, June 21, 1973, 29619/73; Germany, June 27, 1973, 2332754

Int. Cl.² G03C *1/06, 5/20*

U.S. Cl. 96—66 R **4 Claims**

1. In a method for developing a lith-type silver halide material comprising silver halide grains containing silver bromide of less than 65 mole percent and silver chloride of more than 35 mole percent based on total silver halide, the size of the grains being 0.1 to 0.5 μ in diameter, which method comprises developing said photosensitive material which has been imagewise exposed to light by the use of an infectious developer, said developer comprising a silver halide developing agent consisting essentially of hydroquinone and (2) free sulfurous acid ions of very low concentration, the improvement which comprises said photosensitive material comprising, in an amount of 5 mg to 5 g per mole of silver halide, a compound represented by the following general formula:



wherein R_1 is an alkyl, aryl, aralkyl, arylthio, or aryloxy group which can have hydroxy, halogen, nitro, alkoxy, amine and/or alkyl substituents and R_2 is hydrogen, halogen, alkyl, alkoxy or nitro.

4,001,022

PHOTOGRAPHIC MATERIALS COMPRISING DEVELOPER LAYERS AND BINDERS COMPRISING SILICA SOL

Melville R. V. Sahyun, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 13, 1975, Ser. No. 604,354

Int. Cl.² G03C *1/48, 1/06, 1/72, 1/31*

U.S. Cl. 96—76 R **5 Claims**

1. A photographic element suitable for rapid processing by the stabilization method comprising a support bearing superposed in either order: (1) a developer layer having a pH from about 2 to 7 and comprising a silver halide developing agent and a hydrophilic binder at least 45 weight percent being a silica sol, and (2) a silver halide emulsion layer having a pH from about 7 to about 10.5 and comprising a dispersion of silver halide in a hydrophilic binder that comprises by weight on a dry basis (a) about 60 to 94% colloidal silica, and (b) about 6 to 40% of gelatin.

4,001,023

ADHESION OF HYDROPHILIC LAYERS ON POLYESTER FILM

August Jean Van Paesschen, Antwerp; Lucien Janbaptist Van Gossum, Kontich, and Jan Jozef Priem, Mortsel, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Division of Ser. No. 363,390, May 24, 1973, Pat. No. 3,911,172. This application June 3, 1975, Ser. No. 583,209

Claims priority, application United Kingdom, May 26, 1973, 25069/73

Int. Cl.² G03C *1/78*

U.S. Cl. 96—87 A **1 Claim**

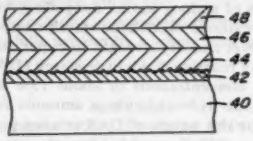
1. Photographic gelatin silver halide light-sensitive material comprising a biaxially stretched polyester film support, a single adhesive layer adhered to said polyester film after longitudinal stretching of said film and stretched integrally with said film in the transverse direction, said stretched film and layer being heat-set at 180°–220° C, and at least one light-sensitive gelatin silver halide emulsion layer, said adhesive layer comprising 30 to 80% by weight of chlorine-containing copolymer, 5 to 30% by weight of gelatin, 5 to 40% by weight of a plasticizer for said gelatin, and 8 to 30% by weight of a metal-complexing antistatic agent, said chlorine-containing copolymer comprising about 70 to 95% by weight of a vinyl chloride and/or vinylidene chloride, about 0.5 to 10% by weight of a hydrophilic monomer, and about 0.5 to 25% of at least one other copolymerizable monomer, and said antistatic agent beinga sulphosalicylic acid salt.

4,001,024

METHOD OF MULTI-LAYER COATING

Donald Allen Dittman, and Francis Armand Rozzi, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,883
Int. Cl.² G03C 1/74; B05D 1/34
U.S. Cl. 96—87 R 15 Claims



2. In a method of manufacturing a photographic element by simultaneously applying a plurality of layers of liquid photographic coating compositions to a moving web of photographic support material in which each of said compositions is fed into a coating bead which is maintained in bridging relationship between the surface of said web and a coating device spaced therefrom and the surface of said web is continuously moved across and in contact with said coating bead to simultaneously pick up all of said layers, the improvement wherein the speed of the web is at least 100 centimeters per second, the lowermost layer is thin and formed of a coating composition of low viscosity, and the layer immediately above the lowermost layer is thicker than the lowermost layer and formed of a coating composition of higher viscosity; the thickness and viscosity of the lowermost layer and of the layer immediately above it being such that vortical action of said coating bead is confined within the lowermost layer and the layer immediately above it, whereby interlayer mixing occurs between the lowermost layer and the layer immediately above it but all other layers are coated in distinct layer relationship.

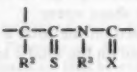
4,001,025

PROCESS OF SENSITIZING SILVER HALIDE EMULSIONS WITH HETEROCYCLIC SULFUR COMPOUNDS

Derek J. Cash, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 10, 1974, Ser. No. 513,492
Int. Cl.² G03C 1/28
U.S. Cl. 96—107 17 Claims

1. A process for sensitizing a photographic silver halide emulsion comprises digesting the silver halide emulsion in contact with a sensitizing amount of a sensitiser whereby said sensitiser compound forms on the silver halide crystals the silver sulphide at a reaction rate v, where $v = k \cdot$ [concentration of the sensitiser compound in the emulsion] and k, the rate constant for the sulphide formation under the digestion conditions, is in the range of from 0.1 to 100 min^{-1}, the sensitiser compound being capable of distributing itself over the silver halide crystal surfaces at a rate which is fast as compared with the reaction rate of the sensitiser compound and the silver halide crystals, in which the sensitiser compound is a compound which includes as part of a 5-, or 6-membered heterscyclic ring the grouping:



in which R^2 and R^3 represents a hydrogen atom or an alkyl, alkylene, aryl, aralkyl or alkaryl group, and X represents an oxygen or sulphur atom.

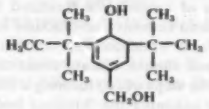
4,001,026

METHOD AND MATERIALS FOR THERMOPLASTIC RECORDING

Antoon Leon Vandenberghe, Hove; Frans Clement Heugebaert, and Albert Lucien Poot, both of Kontich, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Continuation of Ser. No. 369,125, June 12, 1973, abandoned. This application June 24, 1975, Ser. No. 589,695
Claims priority, application United Kingdom, June 13, 1972, 27656/72
Int. Cl.² E03C 1/02, 5/30
U.S. Cl. 96—114.1 9 Claims

2. A method for recording and reproducing information comprising the steps of image exposing to ultraviolet or actinic radiation a photosensitive recording element comprising a photodeactivatable reductor capable of reducing a silver salt at elevated temperature, and uniformly heating said exposed element while the same is in intimate contact with an image-forming layer comprising an admixture of a reducible silver salt and a sterically hindered phenol derivative having the following structural formula:



said silver salt being a silver salt of an aliphatic carboxylic acid containing at least 14 carbon atoms, and said reductor being a naphthol, a pyrazolin-5-one, an indane-dione-1,3, or an acetoacetonitrile compound, deactivated by said radiation exposure.

4,001,027

INK CONTAINING METHYLENEDISALICYLIC ACID AND METHOD FOR OFFSET PRINTING

Richard George Lankes, Jr., Fairfield, Ohio, assignor to Borden, Inc., Columbus, Ohio

Filed Jan. 24, 1975, Ser. No. 543,662
Int. Cl.² C09D 11/02, 11/06, 11/12
U.S. Cl. 106—23 14 Claims

1. Printing ink suitable for offset printing comprising a varnish and pigment derived from fluorescein and 5 to 20% of methylenedisalicyclic acid, based on the weight of said pigment.

4,001,028

METHOD OF PREPARING CRACK-FREE MONOLITHIC POLYCRYSTALLINE CORDIERITE SUBSTRATES

Rodney I. Frost; Irwin M. Lachman, and Paul H. Rieth, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 28, 1974, Ser. No. 473,396
Int. Cl.² C04B 35/04, 33/00, 35/14; C01F 1/00
U.S. Cl. 106—62 6 Claims

3. The method of claim 2 wherein the raw clay is selected from laminated kaolin, delaminated kaolin, and mixtures thereof.

4,001,029

GUNNABLE REFRACTORY COMPOSITION

Nicholas Cassens, Jr., Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sept. 26, 1975, Ser. No. 617,262
Int. Cl.² C04B 35/68, 35/02; B28B 19/00, 7/28
U.S. Cl. 106—67 16 Claims

1. A refractory composition suitable for gunning by the method wherein water is admixed with the composition in a gun nozzle and particularly adapted for gunning onto hot

surfaces, consisting essentially of (1) from about 1% to about 5% aluminum sulfate, (2) from about 0.5% to about 5% hydrated lime, (3) from about 0.5% to about 5% bentonite, the balance being (4) sized refractory grain, all percentages being by weight of the total composition.

4,001,030

TREATMENT OF WASTE PRODUCTS FROM PORTLAND CEMENT MANUFACTURE

David Watson, New Barn, near Dartford, and Arthur William Brown, London, both of England, assignors to The Associated Portland Cement Manufacturers Limited, London, England

Filed Feb. 18, 1975, Ser. No. 550,569
Claims priority, application United Kingdom, Feb. 28, 1974, 9093/74; Mar. 8, 1974, 10536/74
Int. Cl.² C04B 7/06
U.S. Cl. 106—100 7 Claims

1. In a process of calcining a fluidized bed of flue dust arising from Portland cement manufacture to volatilize alkali metal salts therefrom while causing combination of the calcium carbonate and aluminosilicate constituents of the dust, which comprises the steps of (a) forming a fluidized bed of the flue dust; and (b) calcining the fluidized bed of step (a) at a temperature sufficient to calcine the dust but not more than about 1200° C so that the content of liquid calcium aluminate and calcium aluminoferrite phases are not so high as causes the fluidized bed to become inoperable, whereby there is limited reaction between calcium oxide and aluminosilicate contents of the flue dust; the improvement which comprises:

c. carrying out step (b) in the presence of a minor amount of calcium fluoride sufficient significantly to increase said limited reaction between calcium oxide and aluminosilicate contents of the flue dust at said temperature; and

d. recovering a product which is sufficiently low in free calcium oxide content as to allow the product to be reintroduced into a cement making process.

4,001,031

PROCESS FOR MAKING LOW ALKALI CEMENT CLINKER

Andrew T. McCord, Snyder; Louis E. Wagner, Elma, and Theodore J. Reese, Snyder, all of N.Y., assignors to Chem-Trol Pollution Services, Inc., Model City, N.Y.

Continuation-in-part of Ser. No. 416,458, Nov. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 311,898, Dec. 4, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,663
Int. Cl.² C04B 7/02
U.S. Cl. 106—100 6 Claims

1. The method of making cement clinker, which comprises the steps of:

a. forming a raw feed mix which when calcined will produce cement clinker having an unacceptable high value of K_2O alkalinity;

b. continuously introducing the raw feed mix of step (a) into one end of a kiln while recovering cement clinker from the other end of the kiln;

c. firing the kiln with a fuel at a rate sufficient to produce the cement clinker; and

d. controlling the K_2O alkalinity of the recovered clinker by incorporating a chlorinated organic liquid fuel as part of the fuel employed to fire the kiln in step (c), said organic liquid fuel being incorporated in amount sufficient significantly to reduce the K_2O alkalinity of the recovered clinker.

4,001,032

METHOD OF MAKING NONGELLING AQUEOUS CATIONIC DIALDEHYDE STARCH COMPOSITIONS

Harley D. Heath; Bernard T. Hofreiter, and Adrian J. Ernst, all of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 13, 1975, Ser. No. 604,363
Int. Cl.² C08L 3/04
U.S. Cl. 106—213 5 Claims

1. A process of making stable, nongelling, high-concentration, aqueous cationic dialdehyde starch compositions useful for imparting wet and dry strength to paper and paper products comprising reacting dialdehyde starch (DAS) in aqueous dispersions at concentrations of about 15% by weight with betaine hydrazide hydrochloride in amounts equal to from 3 [-] to 5% of the dry weight of DAS at a temperature of from about 90° C. to 95° C., and holding the resultant reaction mixtures at said temperature for a time inversely related to the amounts of said betaine hydrazide hydrochloride and sufficient to form aqueous dispersions having a pH of from 2.5 to 3.5 which remain fluid when cooled to 25° C.

4,001,033

COMPOSITION AND METHOD FOR SOIL STABILIZATION

Robert Anthone, 602 N. Spruce, Valley, Nebr. 68064 and Michael P. Parks, 9322 Oak St., Omaha, Nebr. 68124.

Filed Sept. 26, 1974, Ser. No. 509,458
Int. Cl.² C08H 5/04; C08L 97/02; C09K 3/22; E01C 7/36
U.S. Cl. 106—287 SS 5 Claims

1. A composition for stabilizing soil particles comprising:

a major part of lignin sulfonate; and

a minor part of an additive consisting essentially of fatty acid ester of polyglycerol and polyoxyethylene ether of dialkyl phenol.

4,001,034

HIGH TEMPERATURE COATINGS BASED ON POLY (ZINC PHOSPHINATES)

Joseph Simkin, Lafayette Hill, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 31, 1975, Ser. No. 627,808
Int. Cl.² C09C 1/36
U.S. Cl. 106—292 1 Claim

1. A coating composition composed of a solvent mixture of about 1.0 percent by weight $ZnCl_2$; about 5.7 percent by weight $Ph(PhSO_2C_6H_4)P(O)OH$; about 1.2 percent by weight $Me(Ph)P(O)OH$; about 11.2 percent by weight TiO_2; and the balance substantially all solvent.

4,001,035

COLORING COMPOSITION

Masahiko Ito, Kasukabe; Hiromichi Wada, Yashio; Fumio Kondo, Toride, and Fukio Kai, Kawaguchi, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 490,744, July 22, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,929
Claims priority, application Japan, Jan. 16, 1974, 49-7009
Int. Cl.² C08J 3/22
U.S. Cl. 106—307 12 Claims

1. A coloring composition prepared by the process comprising mixing under high shear stress:

a. 10 to 90 wt% based on the total *a* and *b* of a pigment;

b. 90 to 10 wt% based on the total *a* and *b* of a carrier resin; and

c. 0.05 to 5 wt% based on the total *a* and *b* of an organic compound having an active hydrogen atom; selected from the group consisting of phenols, primary or secondary amines, mercaptobenzimidazole, dilauryl thiodipro-

pionate, tri-(nonylphenyl) phosphate, distearyl thiodipropionate, p-benzoquinone, hydroquinone, catechol, tert-butyl catechol, nitrosobenzene, picric acid, dithiobenzoyl disulfide and mixtures thereof; in the presence of 0.5 to 3 wt parts of a water soluble inorganic salt per part of the total *a* and *b*, and 0.1 to 1 wt part per part of total *a* and *b* of a hydrophilic solvent selected from the group consisting of dimethylformamide, diacetone alcohol, methyl-ethyl ketone, ethyleneglycol monomethyl ether and ethyl-eneglycol monoethyl ether; and

separating said coloring composition from the inorganic salt and hydrophilic solvent by washing with water.

4,001,036

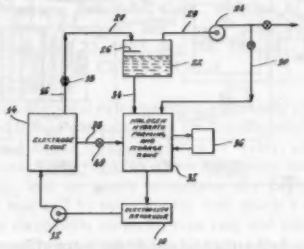
SYSTEM FOR IMPROVING CHARGE EFFICIENCY OF A ZINC-CHLORIDE BATTERY

Alby M. Berman, Oak Park; Richard C. Walker, Gaylord, and David J. Aller, Royal Oak, all of Mich., assignors to Energy Development Associates, Madison Heights, Mich.

Filed Nov. 20, 1975, Ser. No. 634,004

Int. Cl.² H01M *10/00*

U.S. Cl. 429—67 **8 Claims**



1. An improved electrical energy storage system comprising:

at least one cell having a relatively positive metal electrode and a relatively negative halogen electrode separated by an aqueous electrolyte containing ions of said metal and halogen,

means for forming and storing a quantity of halogen hydrate,

means for circulating said electrolyte to said cell and said means for forming and storing said halogen hydrate,

throttling means for partially reducing the pressure on the circulating electrolyte while maintaining the pressure in the cell, thereby causing chlorine to be desorbed therefrom; and

means for separating the desorbed chlorine from the electrolyte under reduced pressure.

4,001,037

LEAD BATTERIES

Fritz Beck, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 285,248, Aug. 31, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,665

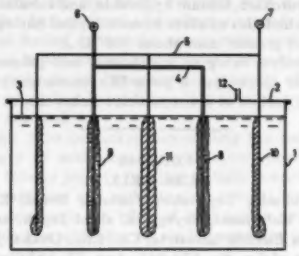
Claims priority, application Germany, Sept. 3, 1971, 2144198

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² H01M *4/36*

U.S. Cl. 429—188 **3 Claims**

1. A lead battery which can be alternately charged and discharged which comprises: a.) an electrolyte selected from the group consisting of perchloric acid, tetrafluoboric acid, fluosilicic acid and sulfamic acid and their corresponding lead salts; b.) a positive lead oxide electrode having a base plate made of titanium; and, c.) a negative lead electrode having a



base plate made of graphite or of a graphite powder embedded in a binder which is stable to the electrolyte.

4,001,038

METHOD OF STRIPPING PAINT IN A MOLTEN SALT BATH

Timothy R. Justice, Inkster, and Robert W. Foreman, Bloomfield Hills, both of Mich., assignors to Park Chemical Co., Detroit, Mich.

Filed July 1, 1975, Ser. No. 592,103

Int. Cl.² B08B *3/08*

U.S. Cl. 134—38 **9 Claims**

1. A method of using a salt composition as a paint stripping salt, comprising the steps of:

providing a salt bath composition comprised of in weight percent;

a. about 25% to about 90% of caustic material selected from at least one of the group consisting of alkali and alkaline earth caustic materials,

b. about 2% to about 10% of an oxidizing agent selected from at least one oxidizing type material of the group consisting of alkali and alkaline earth metal nitrates, nitrites, molybdates and metasilicates, and vanadates,

c. about 5% to about 40% of a surface scum reducing agent selected from at least one of the group consisting of alkali and alkaline earth metal sulfate and pyrophosphate materials,

d. 0 to about 60% of a diluent salt material selected from at least one of the group consisting of the salts of chlorides, carbonates and fluorides,

maintaining said salt bath in molten form at a temperature from about 600° to about 1100° F;

immersing paint coated objects in said molten salt bath to remove the paint therefrom.

4,001,039

ELECTROCHEMICAL CELL WITH ALKALI AND ALKALINE EARTH METAL CONTAINING ELECTROLYTE

Glenn V. Elmore, Vestal, N.Y., and Howard A. Tanner, Xenia, Ohio, assignors to Leesona Corporation, Warwick, R.I.

Continuation of Ser. No. 767,554, July 31, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 12,758, March 4, 1960, abandoned, and Ser. No. 332,812, Dec. 23, 1963, abandoned. This application May 4, 1971, Ser. No. 140,236

Int. Cl.² H01M *8/14*

U.S. Cl. 429—46 **1 Claim**

1. An electrochemical cell for the direct generation of electricity comprising an anode, a cathode, and an electrolyte in contact with each of said anode and cathode,

each of said anode and cathode being a non-consumable gas diffusion electrode and having an open porous structure to enable diffusion of gases and passage of electrolyte into the structure,

said electrolyte having good conductivity in an aqueous

medium at a temperature below about 200° C., and being a mixture of at least two alkali metal hydroxides selected from the group consisting of potassium hydroxide, sodium hydroxide, lithium hydroxide, and rubidium hydroxide, and includes calcium hydroxide, and having a melting point not greater than about 300° C.,

said electrolyte being so constituted and proportioned to give said electrolyte a paste-like consistency while remaining mobile at a temperature below about 300° C.

4,001,040

FUEL CELL

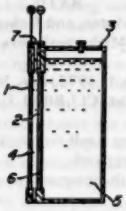
Masataro Fukuda, Toyonaka; Tsutomu Iwaki, Kyoto, and Yoshihiro Kobayashi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 174,041, Aug. 23, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,189

Claims priority, application Japan, Sept. 2, 1970, 45-77670; Sept. 2, 1970, 45-77677; Sept. 4, 1970, 45-78093; Oct. 16, 1970, 45-88575

Int. Cl.² H01M *4/00, 8/04*

U.S. Cl. 429—15 **12 Claims**



1. In a fuel in which electrochemical reaction is carried out by dissolving hydrazine fuel in an aqueous solution of caustic alkali as an electrolyte, the improvement in that the inside of a jar containing an oxidation electrode and a fuel electrode is divided into a first chamber and a second chamber by said fuel electrode, said oxidation electrode is provided in said first chamber so that it opposes said fuel electrode, a porous film which is inactive to fuel and electrolyte-resistant is provided to adhere to the surface of said fuel electrode which faces said second chamber, said fuel electrode allowing the electrolyte in which the fuel is dissolved to freely pass therethrough, said porous film produced by binding with a resin binder powders of a substance which is inactive to said fuel and electrolyte-resistant selected from the group consisting of nickel oxide, aluminum oxide, iron oxide, magnesium oxide and graphite whereby the fuel in the electrolyte which is introduced into said second chamber diffuses through said porous film and said fuel electrode to reach said first chamber.

4,001,041

PRESSURIZED FUEL CELL POWER PLANT

Maurice C. Menard, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1975, Ser. No. 549,597

Int. Cl.² H01M *8/06*

U.S. Cl. 429—17 **14 Claims**

1. A power plant for generating electricity comprising:

a fuel cell stack including a plurality of fuel cells connected electrically in series through a load, each cell comprising a cathode electrode, an anode electrode, an electrolyte disposed therebetween, a cathode gas space on the nonelectrolyte side of said cathode electrode and an anode gas space on the nonelectrolyte side of said anode electrode;

compressor means for compressing air to greater than two atmospheres pressure including a compressor and turbine means operably connected to said compressor;

means for delivering air at a pressure of at least two atmospheres from said compressor into said cathode gas space;

fuel conditioning apparatus including a reactor for producing hydrogen from a hydrogen containing fuel and steam;

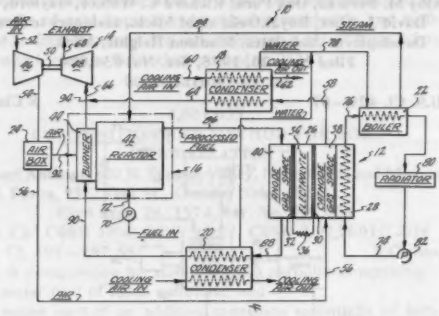
burner means for providing heat to said reactor;

means for producing steam and for delivering said steam into said reactor;

means for delivering pressurized hydrogen containing fuel into said reactor;

means for delivering pressurized hydrogen from said fuel conditioning apparatus into said anode gas space;

condenser means disposed upstream of said turbine means for condensing out water from said anode gas space and cathode gas space effluent gases at least a first portion of said condenser means being disposed downstream of said anode gas space and upstream of said burner means;



means for delivering said anode gas space effluent gases into said first portion of said condenser means for recovering water therefrom;

means for delivering said cathode gas space effluent gases into said condenser means for recovering water therefrom;

means for delivering said anode gas space effluent gases from said condenser means into said burner means;

means for delivering the condensed out water from said condenser means to said means for producing steam; and

means disposed downstream of said condenser means for delivering effluent gases from said cathode gas space and burner means into said turbine means for powering said turbine means and driving said compressor.

4,001,042

SCREEN PRINTING FUEL CELL ELECTROLYTE MATRICES USING POLYETHYLENE OXIDE AS THE INKING VEHICLE

John C. Trocciola, Glastonbury; Dan E. Elmore, South Windsor, and Ronald J. Stosak, Ellington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 2, 1975, Ser. No. 609,860

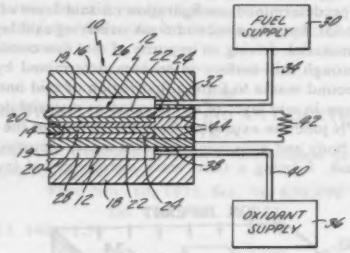
Int. Cl.² H01M *8/00, 2/14*

U.S. Cl. 427—115 **4 Claims**

1. A process for making a fuel cell electrode/matrix element comprising the steps of:

screen printing a hydrophilic electrolyte matrix layer onto the surface of a fuel cell gas diffusion electrode, said electrode including a catalyst layer on the surface onto which the matrix layer is printed, said step of printing including forming an ink by mixing an aqueous solution of polyethylene oxide with a matrix material, and printing

said ink onto the surface of said electrode through a screen; and



heat treating the matrix layer so formed to remove most of the aqueous solution of polyethylene oxide.

4,001,043

ANODE MODERATOR FOR REACTIVE METAL ELECTROCHEMICAL CELLS

William R. Momyer, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 23, 1975, Ser. No. 580,303
Int. Cl.² H01M *6/04*
U.S. Cl. 429—206 **7 Claims**

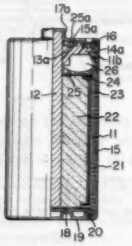
1. An electrochemical cell consisting essentially of a lithium anode spaced from a cathode by an electrically insulating film formed on said anode in the presence of water, an aqueous lithium hydroxide electrolyte in which said anode and cathode are immersed, and an anode moderator for improving the efficiency of said cell by reducing the said anode's sensitivity to changes in electrolyte molarity, flow rate and temperature, said anode moderator consisting essentially of soluble peroxide ions.

4,001,044

DRY CELL

Jun Miyoshi, Miigaoka Neyagawa; Yoji Kajikawa, Katano; Akira Ota, Fujisaka Hirakata; Junichi Asaoka, Moriguchi, and Yoshio Kino, Miyanosaka Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 11, 1975, Ser. No. 612,303
Claims priority, application Japan, Sept. 20, 1974, 49-109091; Sept. 20, 1974, 49-114257[U]
Int. Cl.² H01M *6/06*
U.S. Cl. 429—166 **9 Claims**



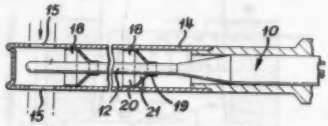
1. A dry cell comprising
a. a depolarizing mix comprised of manganese dioxide, carbon black and electrolyte comprised of zinc chloride and ammonium chloride,
b. an anode comprising a zinc can having an open top,
c. a separator comprising a paper sheet base and a gelatinous paste layer formed on the surface opposite to the surface in contact with the inner wall of said zinc can for separating said zinc can from said depolarizing mix,
d. a cathode collector within said zinc can and separated therefrom, and comprising a carbon electrode,
e. a plastic top seal for sealing the open top of said zinc can, said plastic top seal being provided with a center hole through which said cathode collector extends, said plastic top seal having an annular recess ridge and an annular recess in its top surface and coaxial with said center hole, said annular recess being radially inwardly of said ridge,
f. a filler or sealing agent filling said annular recess of said plastic top seal,
g. a plastic tube or jacket surrounding the radially outer periphery of said zinc can, the upper portion of said plastic tube or jacket extending radially inwardly over the top of said zinc can and into said annular recess of said plastic top seal, the edge of said upper portion being embedded in said filler or sealing agent in said annular recess, and
h. a metal top seal placed over said plastic top seal and having a cathode cap formed integral therewith and fitted over the cathode collector, said cathode collector extending upwardly from the top of said plastic top seal.

4,001,045

THERMOCOUPLE

George Watson Smith, London, England, assignor to Sangamo Weston Limited, Enfield, England

Filed Mar. 3, 1975, Ser. No. 554,457
Int. Cl.² F16K *16/20*
U.S. Cl. 136—230 **6 Claims**



1. A thermocouple comprising a temperature-responsive thermocouple element having a first relatively large diameter portion and an elongated second relatively small diameter portion, a rigid sheath co-axially surrounding the thermocouple element, and support means mounted on said second portion of the thermocouple element, said support means in use being incapable of movement relative to the thermocouple element lengthwise of said second portion and having at least one surface in sliding contact with the internal wall of said sheath permitting the thermocouple element to slide within the sheath.

4,001,046

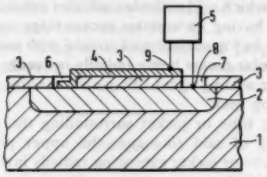
THERMOELEMENT ON SEMICONDUCTOR BASE

Herbert Weiss, Munich; Otto Maurer, Worth, and Peter Kolbow, Minfeld, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 21, 1973, Ser. No. 399,632
Claims priority, application Germany, Sept. 29, 1972, 2247962
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² H01L *35/04*
U.S. Cl. 136—205 **12 Claims**

1. A two-pole thermoelement arrangement consisting essentially of a semiconductor base, a semiconductor zone, an electrically insulating layer, a conductive path and two terminal contacts, said conductive path being elongated and electrically conductively connected at one end thereof to said semiconductor zone with the remainder of said conductive layer being arranged on said electrically insulating layer, said electrically insulating layer being positioned outside such connection between said conductive path and said semiconductor zone, said semiconductor zone being a doped elongated zone adjacent one face of said semiconductor base, said electrically

insulating layer being elongated and arranged in generally adjacent relationship to said semiconductor zone, one of said terminal contacts being on the opposite end of said conductive



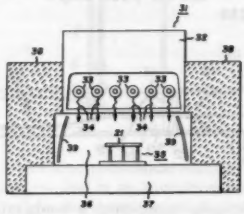
path, the other of said terminal contacts being on said semiconductor zone in a region thereof generally adjacent said one terminal contact but generally remote from such connection.

4,001,047

TEMPERATURE GRADIENT ZONE MELTING UTILIZING INFRARED RADIATION

John K. Boah, Auburn, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed May 19, 1975, Ser. No. 578,807
Int. Cl.² H01L *21/225*
U.S. Cl. 148—1.5 **16 Claims**



1. A method of forming a region of a selected conductivity type in a body of semiconductor material comprising the steps of:

providing a body of semiconductor material;

depositing a quantity of a dopant on one surface of said body, said dopant being deposited in a predetermined pattern and being of a selected conductivity type;

exposing the surface of said body opposite said one surface to infrared radiation, said radiation having an intensity such that said dopant thermally migrates into said body toward said opposite surface and leaves in its path in said semiconductor material a region of recrystallized material uniformly doped to the solid solubility limit of said dopant.

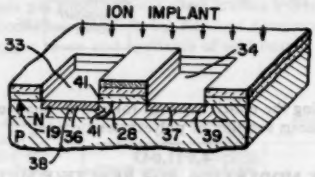
4,001,048

METHOD OF MAKING METAL OXIDE SEMICONDUCTOR STRUCTURES USING ION IMPLANTATION

Gerald S. Meiling, Cupertino, and Thomas P. Cauge, Mountain View, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 483,157, June 26, 1974, Pat. No. 3,895,390, which is a continuation of Ser. No. 309,431, Nov. 24, 1972, abandoned. This application May 23, 1975, Ser. No. 580,339
Int. Cl.² H01L *21/265*
U.S. Cl. 148—1.5 **22 Claims**

1. In a method of forming a metal oxide semiconductor structure, providing a semiconductor body having at least a portion thereof with an impurity of one conductivity type therein, forming a layer of semiconductor material of opposite conductivity type on said body so that said layer has a planar surface, forming a layer of insulating material on said planar surface having a relatively precise thickness, forming a first mask of a predetermined configuration on said layer of insulating material, forming a second mask overlying said layer of insulating material, driving an impurity of said one conductivity type through said surface in an area determined by said first and second masks to form a first region of said one conductivity type in said layer of semiconductor material defined by a first PN junction extending from the surface to the semiconductor body and underlying said first mask, removing said second mask, forming a third mask overlying said layer of



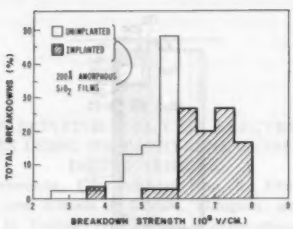
insulating material and having openings therein for the source and drain immediately adjacent the first mask, driving an impurity of said opposite conductivity type through the openings in said third mask and through said surface to form source and drain regions of opposite conductivity type in said layer of semiconductor material, providing a relatively thick layer of insulating material overlying the first named layer of insulating material, and forming contacts extending through the thick layer of insulating material making contact with said source and drain regions to provide source and drain contacts and with said first mask to provide a gate contact, one of said steps of driving in an impurity being carried out by ion implantation.

4,001,049

METHOD FOR IMPROVING DIELECTRIC BREAKDOWN STRENGTH OF INSULATING-GLASSY-MATERIAL LAYER OF A DEVICE INCLUDING ION IMPLANTATION THEREIN

John E. Baglin, Mohegan Lake; Thomas H. DiStefano, Tarrytown, and King-Ning Tu, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 11, 1975, Ser. No. 585,924
Int. Cl.² H01L *21/265*
U.S. Cl. 148—1.5 **7 Claims**



1. Method for increasing the dielectric breakdown strength of an amorphous SiO_2 film with thickness less than approximately 1 micron of a device in an electric field supporting path of said device comprising steps of:

fabricating said device in a portion thereof including fabricating said film,

irradiating said film with ions selected from the group comprising hydrogen, helium, argon, krypton, neon and xenon, and being of sufficient fluence and energy to densify said film by at least 50 percent of saturation compaction as averaged over the range of said ions in said film and

being of insufficient energy to penetrate completely through said film, and

annealing said film with a combination of time and temperature to remove substantially electric charge introduced therein by said energetic ions,

whereby the dielectric breakdown strength of said film is increased.

4,001,050

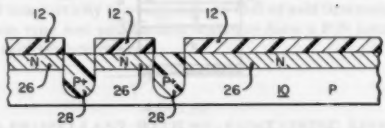
METHOD OF FABRICATING AN ISOLATED P-N JUNCTION

Tuh-Kai Koo, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 10, 1975, Ser. No. 630,490

Int. Cl.² H01L *21/383*

U.S. Cl. 148—1.5 **10 Claims**



1. A method of forming a semiconductor device comprising the steps of:

providing a semiconductor wafer of given conductivity;

implanting a given concentration of a first dopant, of an impurity of the opposite type of conductivity, under the surface of the wafer;

thermally diffusing a second dopant, of the given conductivity, into selected areas on the surface of the wafer, the second dopant concentration being greater than the concentration of the first dopant;

driving the first and second dopant into the wafer.

4,001,051

METHOD AND APPARATUS FOR PROTECTING SUPPORT ELEMENTS FOR CAST METAL STRANDS DURING STRAND CUTTING

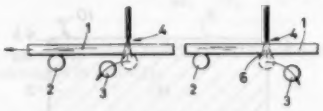
Carl John, Hochdahl, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

Filed Feb. 20, 1975, Ser. No. 551,326

Claims priority, application Germany, Nov. 27, 1974, 2502615; Feb. 23, 1974, 2408855

Int. Cl.² B23K *31/10*

U.S. Cl. 148—9 R **2 Claims**



1. A method for protecting the support rolls of a freshly cast continuous metal strand from damage and deterioration from the effects of a cutting torch working on that strand; the steps which comprise

a. moving said strand continuously over a plurality of spaced transverse support rolls while continuously moving a cutting torch therewith;

b. pivoting individual ones of said support rolls from a support position against said strand to a non-support position away from said strand and back sequentially as said cutting torch passes adjacent the support position of the respective individual support rolls, said support position and said non-support position being parallel to each other;

c. the movement of the individual support rolls being in arcs adjacent and substantially parallel to the path of movement of said strand;

d. the sequential movement of said rolls from one position to another being during moments of highest exposure in the support position to the effects of said cutting torch and in direct relation to the movement thereof;

e. the movement of said rolls in the same direction of said torch being at the same speed as the speed of advance of said torch, and maintained at periphery of the spray cone; and

f. the pivoting speed of said support rolls in a direction opposite said cutting torch movement being greater than the pivoting speed of said rolls in the same direction as said cutting torch movement and through the spray cone thereof.

4,001,052

HOT-ROLLED LOW-CARBON STEEL STRIP WITH AN EXCELLENT PRESS-WORKABILITY CAPABLE OF FORMING SMOOTH PRESSED SURFACE AND A METHOD OF MAKING THE SAME

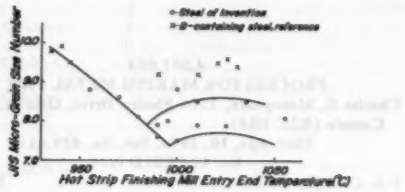
Yoshio Nakazato; Masatoshi Nakazawa; Nobuo Ohashi, and Yo Ito, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation-in-part of Ser. No. 290,393, Sept. 19, 1972, abandoned. This application Nov. 13, 1974, Ser. No. 523,537

Claims priority, application Japan, Sept. 30, 1971, 46-75795

Int. Cl.² C21D *9/48*; C22C *38/00*

U.S. Cl. 148—12 C **17 Claims**



1. Hot-rolled low-carbon deoxidized steel strip having a smooth pressed surface produced by hot-rolling a low carbon deoxidized steel in a hot-strip mill while maintaining the temperature at the entry end of the hot-strip mill above 950° C and the temperature at the delivery end above the A3 transformation point of the steel to form hot-rolled steel strip, said steel consisting essentially of up to 0.12% by weight of carbon, up to 0.01% by weight of nitrogen, up to 0.0094% by weight of boron, and balance iron, the ratio of the boron content in percent by weight to the nitrogen content in percent by weight being 0.3 to 0.94, said hot-rolled steel strip having a ferrite grain size number, JIS, of 7 to 9, and press forming the steel strip after hot-rolling to form said smooth pressed surface without cold-rolling or annealing said steel strip.

4,001,053

METHOD OF REMOVING RESIDUAL STRESS OF A WORK FORMED OF METAL OR CERAMIC AND A SEALING APPARATUS

Taro Igisu, Fukuoka, Japan, assignor to EIM Electric Co., Ltd., Kita-Kyushu, Japan

Continuation-in-part of Ser. No. 267,651, June 29, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,250

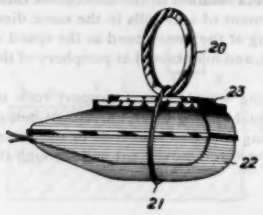
Claims priority, application Japan, Apr. 21, 1972, 47-40562; Dec. 5, 1972, 47-122207

Int. Cl.² C21D *1/04*

U.S. Cl. 148—12.9 **13 Claims**

1. A method of removing residual stress of a work compris-

ing movably mounting said work on a vibrator, forcedly vibrating said work at a frequency below the natural frequency



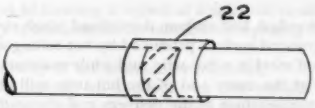
of said work, then releasing said work from said vibrator, thereby affording said work to be subject to free vibration.

4,001,054

PROCESS FOR MAKING METAL PIPE

Charles E. Makepeace, 2314 Elmira Drive, Ottawa, Ontario, Canada (K2C 1H4)

Filed Apr. 10, 1974, Ser. No. 459,611
Int. Cl.² C21D 9/14
U.S. Cl. 148—16.5 **10 Claims**



2. A process for toughening and strengthening a steel pipeline in a direction transverse to its axis to resist crack initiation and propagation, said pipeline being made up of a plurality of coterminous units, which process comprises the steps of:

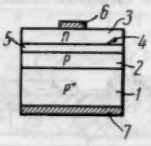
1. carburizing a plurality of longitudinal sections of said units, each of said sections being spaced from each other when in position in said pipeline and being spaced from the ends of the unit in which it is located a sufficient distance to permit conventional welding of the ends, and each section to circumscribe the pipeline at least once, by diffusing a sufficient quantity of carbon into the longitudinal section, during the carburization step, to provide the required carbon content for the ultimately strengthened and toughened section of pipe,
2. subjecting each of said carburized sections to inside and outside quenching to provide quenching throughout its entire wall thickness,
3. tempering each of said carburized sections throughout its entire wall thickness by subjecting each to localized heating, the sections being thereby toughened and strengthened to a yield strength of between 60,000 to 300,000 p.s.i., and
4. welding the ends of said units together to form said pipeline.

4,001,055

SEMICONDUCTOR LIGHT-EMITTING DIODE AND METHOD FOR PRODUCING SAME

Revaz Alexandrovich Charmakadze, prospekt Vazha pshavela, 6 kvartal, 24 korpus, kv. 22; Rafael Iraklievich Chikovani, prospekt Vazha Pshavela, 39b, kv. 53, both of Tbilisi, and Zhores Ivanovich Alferov, Olginskaya ulitsa, 9, korpus 3, kv. 15, Leningrad, all of U.S.S.R.

Division of Ser. No. 466,505, May 2, 1974, Pat. No. 3,958,265. This application Dec. 9, 1975, Ser. No. 639,199
Claims priority, application U.S.S.R., May 28, 1973, 1922832; May 31, 1973, 1924913; June 12, 1973, 1930156
Int. Cl.² H01L 21/208
U.S. Cl. 148—172 **3 Claims**



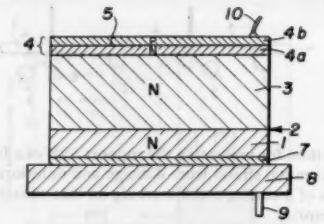
1. A method for producing a semi-conductor light-emitting diode, comprising assembling a substrate of GaAs and two liquid phases of Ga with Al saturated with arsenic, one containing Zn and Te and the other containing Te, contacting said first liquid phase doped with Zn and Te with said substrate to grow an epitaxial p-layer of the diode structure; leaving a layer of said first liquid phase, with the thickness thereof being controlled, on said substrate; contacting said second liquid phase doped with Te with said layer of controlled thickness to alternatively grow the compensated layer having a thickness commensurate with the diffusion length of the injected charge carriers, and an epitaxial n-layer doped to approximately the same concentration level as said compensated layer.

4,001,056

EPITAXIAL DEPOSITION OF III-V COMPOUNDS CONTAINING ISOELECTRONIC IMPURITIES

Warren O. Groves, and Arnold S. Epstein, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 313,227, Dec. 8, 1972, abandoned, which is a division of Ser. No. 158,181, June 30, 1971, abandoned. This application Nov. 11, 1974, Ser. No. 522,380
Int. Cl.² H01L 21/20, 29/12
U.S. Cl. 148—175 **5 Claims**



1. A process for the preparation of electroluminescent material for light-emitting diodes said process comprising:

a. providing in a reaction chamber a substrate of a single-crystal compound formed from Ga and one of the elements selected from the group consisting of As and P;
b. combining in a vapor phase reactant stream reactant materials including electronic impurity atoms, said materials being adapted for the formation of GaP and epitaxial deposition thereof on said substrate, said reactant materials initially being substantially free of isoelectronic impurity atoms;

c. introducing said reactant stream into said reaction chamber;

d. epitaxially depositing on said substrate from said stream said reactant materials to form a first epitaxial layer of a first electrical conductivity type on said substrate, said layer constituting a bulk region substantially free of isoelectronic impurities;

e. introducing into said stream an isoelectronic impurity in vapor form;

f. epitaxially depositing on said substrate from said stream said reactant materials and said isoelectronic impurity to form a second epitaxial layer of said first conductivity type on said first epitaxial layer, said second epitaxial layer constituting a surface region containing said isoelectronic impurity atoms at a concentration of about 2.0×10^{19} atoms/cm.^{3}; and

g. introducing electronic impurity atoms of a second electrical conductivity type opposite to that of said first conductivity type into said surface region to form a P-N junction in said surface region.

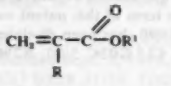
4,001,057
SOLID PROPELLANT WITH NF_2 CONTAINING BINDER AND ENERGETIC PLASTICIZER

Mart G. Baldwin, and Paul H. Gehlhaus, both of Huntsville, Ala., assignors to Rohm and Haas Company, Philadelphia, Pa.

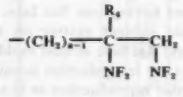
Filed Sept. 24, 1962, Ser. No. 227,109
Int. Cl.² C06B *45/10, 43/00, 33/08*
U.S. Cl. 149—19.3 **4 Claims**

1. Compositions suitable for the manufacture of propellants consisting essentially of

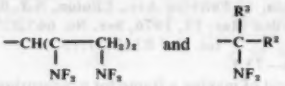
A. 15 to 40 parts of a monomer selected from the group consisting of compounds of the formula



in which R is selected from the group consisting of hydrogen, methyl and ethyl, and R^1 is selected from the group consisting of



in which n is an integer from 1 to 5, and R^4 is selected from the group consisting of H and CH_3.



in which R^2 is selected from the group consisting of hydrogen and lower alkyl containing 1 to 4 carbon atoms, and R^3 is selected from the group consisting of hydrogen and lower alkyl containing 1 to 4 carbon atoms,

B. greater than 0 and less than 20 parts of a plasticizer for the polymers prepared by polymerizing the monomers of A), said plasticizers consisting essentially of a major proportion of compounds containing groups selected from the group consisting of NF_2 and ONO_2,

C. 40 to 60 parts of a solid powdered oxidizer, selected from the group consisting of lithium, sodium, potassium and ammonium salts of nitric and perchloric acids and

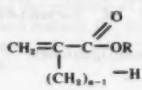
D. 0 to 25 parts of a finely particled readily combustible solid selected from the group consisting of carbon black, aluminum, magnesium, zinc, zirconium, boron, and beryllium.

4,001,058
PROCESS FOR THE PREPARATION OF DEKENYL ACRYLATES AND METHACRYLATES AND PRODUCTS THEREOF

Marion F. Hawthorne, Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,614, Dec. 29, 1958, abandoned. This application Mar. 10, 1961, Ser. No. 94,937
Int. Cl.² C06L *25/00;* **C08F** *218/00*
U.S. Cl. 149—22 **18 Claims**

3. An ester of the formula



in which *n* is 1 to 2 and R is a radical selected from the group consisting of

$(H\not{B}CH_2)_2CH-$,

$(H\not{B})_2CH-$,

$H\not{B}CH_2-$,

$H\not{B}(CH_2)_3-$,

$H\not{B}(CH_2)_2-$,

$H\not{B}(CH_2)_4-$,

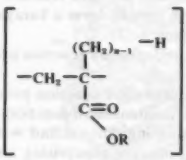
$H\not{B}(CH_2)_5-$,

and

$(CH_2\not{B})_2CH-$

in which formula $-\not{B}-$ represents $-C_2B_{10}H_{10}-$.

12. Polymers of the formula



in which *n* is 1 to 2, R is a radical selected from the group consisting of

$(H\not{B}CH_2)_2CH-$,

$(H\not{B})_2CH-$,

$H\not{B}CH_2-$,

$H\not{B}(CH_2)_3-$,

$H\not{B}(CH_2)_2-$,

$H\not{B}(CH_2)_4-$,

$H\not{B}(CH_2)_5-$,

and

$(CH_2\not{B})_2CH-$,

X is about 5 to 3000, and —D— represents $-C_2B_{10}H_{10}-$.

15. Polymers of claim 12 containing from 5 to 30% on the weight of the polymer of a nitrato ester of an alcohol containing 1 to 10 carbon atoms and having 1 to 3 hydroxyl groups.

4,001,059
NITROGEN- AND FLUORINE-CONTAINING COMPOUNDS

Robert C. Petry, Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 24, 1963, Ser. No. 283,108
Int. Cl.² C06B *23/00*; C07C *121/16*
U.S. Cl. 149—109.4 **5 Claims**

1. A compound selected from the group consisting of 1,2,3-tris(difluoramino)-cyanopropane, 1-cyano-2,3,5,6-tetrakis(difluoramino)hexane, 1-cyano-2,3,6,7-tetrakis(difluoramino)heptane, and mixtures of 1-cyano-bis(difluoramino)pentenes.

5. Mixtures of 1-cyano-bis(difluoramino)pentenes.

4,001,060
METHOD FOR PREPARING AN EXTRUDABLE PRIMING MIXTURE CONTAINING MODIFIED KARAYA GUM

Edward A. Staba, Higganum, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 380,626, July 19, 1973. This application Apr. 11, 1975, Ser. No. 567,202
Int. Cl.² C06B *21/00*
U.S. Cl. 149—109.6 **2 Claims**

1. A method of preparing an extrudable priming mixture displaying improved extrusion characteristics and extended pot life, said method comprising the steps of:

a. forming a suspension of karaya gum in an anhydrous alcohol medium selected from the group consisting of methanol, ethanol, propanol-2, propanol-1 and the butyl alcohols;

b. dissolving a reagent selected from the group consisting of tannic acid, benzoic acid, sorbic acid, gluconic acid, formaldehyde, acetic anhydride, and gluconic acid D-lactone in said suspension to form a reaction solution for said karaya gum;

c. maintaining said suspension of karaya gum in said reaction solution at a reaction temperature of at least room temperature for a time sufficient for said reaction solution to react with said karaya gum to form a karaya gum condensation reaction product;

d. removing said karaya gum condensation reaction product from said solution;

e. drying said karaya gum condensation reaction product;

f. mixing said dry karaya gum condensation reaction product with a mixture of priming ingredients and water to form an extrudable priming mixture comprising about 1 to 2 percent by weight karaya gum condensation reaction product, 16 to 17 percent water, the remainder being priming ingredients.

4,001,061
SINGLE LITHOGRAPHY FOR MULTIPLE-LAYER BUBBLE DOMAIN DEVICES

Kie Y. Ahn, Chappaqua; Michael Hatzakis, Ossining, and John V. Powers, Shenorock, all of N.Y., assignors to International Business Machines Corporation, Armmonk, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,644
Int. Cl.² C23F *1/02*
U.S. Cl. 156—3 **9 Claims**

1. A method for fabricating a magnetic bubble domain device, comprising the steps of;

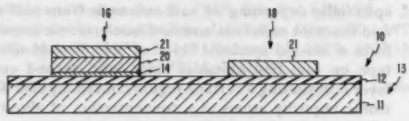
a. depositing a first thin magnetic film on a substrate having a bubble material therein, said magnetic film having a thickness less than about 30 nm;

b. coating said thin film with a resist;

c. exposing said resist in a sensor area and a propagation area with a radiation beam having a different exposure density in said propagation area than in said sensor area;

d. partially developing said resist, so as to expose said thin film only in said sensor area;

e. electroplating on said first magnetic film a second film of a metal having a conductivity higher than that of magnetic film, said second film having a thickness greater than about 200 nm;



f. further developing said resist, so as to expose said first thin film in said propagation area;

g. electroplating a third film onto said first magnetic film in said propagation area, said third film being a magnetic film used to propagate said magnetic bubble domains;

h. removing any remaining undesired resist and any remaining undesired first magnetic film.

4,001,062
VARIABLE SCALE RELIEF REPRODUCTION PROCESS AND PRODUCT THEREOF

Yoshiharu Iisaka; Yasuo Katsurada; Shigeo Suzuki, all of Tokyo, and Takatoshi Saijo, Kawasaki, all of Japan, assignors to Kyodo Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 355,609, April 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 889,369, Dec. 31, 1969, Pat. No. 3,748,202. This application May 19, 1975, Ser. No. 578,789
Claims priority, application Japan, Apr. 19, 1969, 44-30474
The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.
Int. Cl.² G03C *5/00*; B29C *1/02*
U.S. Cl. 156—59 **27 Claims**

1. A relief printing process suitable for reproducing in mass-production the color and surface irregularities of subject matter including art works, crafts and oil paintings, comprising the steps of preparing a first mold of a hardenable material, said mold being the inverse on a selected scale of said subject matter, preparing a transparent moldment in said mold, said moldment having one flat face, preparing a color reproduction of said subject matter on the same selected scale, and joining said flat face of said moldment to said color reproduction so that the irregularities in said moldment are in registry with said color reproduction as in said subject matter.

4,001,063
MEASURING INSTRUMENT

Peter P. Vaida, 17 Fairview Ave., Clinton, N.J. 08809

Filed Mar. 15, 1976, Ser. No. 667,027
Int. Cl.² B32B *31/16*
U.S. Cl. 156—73.1 **3 Claims**

1. A method of making a frame for a measuring instrument, said instrument including reference surfaces and a vial disposed in a desired orientation with respect to said reference surfaces, comprising the steps of:

molding a first part of said frame,

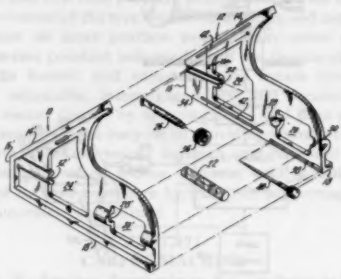
molding a mating second part of said frame,

said molded frame parts each including reference surfaces, openings for receipt of a vial, and first and second recesses formed in the border of each of said openings for positioning said vial, said first and second recesses being aligned in a predetermined angular relationship with respect to said reference surfaces and cooperating to form oppositely disposed cavities when said molded frame parts are in mating relationship;

placing a vial in recesses of one of said frame parts, the

longitudinal axis of said vial being in said predetermined angular relationship with said reference surfaces;

aligning said frame parts in mating relationship with said vial in said cavities; and



fastening said mated frame parts together to form a unitary structure in which the longitudinal axis of said vial is disposed in said predetermined angular position.

4,001,064

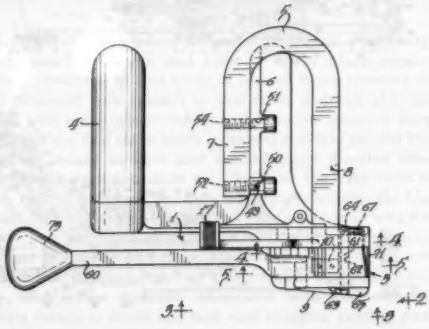
MANUAL STRAPPING TOOL

Robert J. Nix, Park Ridge, Ill., assignor to Signode Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 515,435, Oct. 21, 1974, abandoned. This application Sept. 3, 1975, Ser. No. 609,361

Int. Cl.² B32B *31/18, 31/20*

U.S. Cl. 156—73.6 19 Claims



16. A method for joining overlapping portions of a thermoplastic strap, comprising the steps of: gripping and compressing the overlapping strap portions between opposing strap gripping surfaces of a pair of jaws, one of the jaws being fixedly mounted on a base, the other jaw being attached to a vibratory end of a cantilevered bar spring anchored to the base so that the spring urges one gripped strap portion against the other gripped strap portion; deflecting the vibratory end to store a predetermined amount of energy in said bar spring; and releasing the vibratory end of said cantilevered bar spring to effect relative oscillatory movement between said gripped strap portions to cause oscillating and sliding frictional movement between said compressed overlapping strap portions sufficient to melt the interface regions thereof.

4,001,065

CROSS-LINKED OLEFINE-ESTER TAPES

Richard John Penneck, Lechlade, and Robin James Thomas Clabburn, Highworth, both of England, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 296,626, Oct. 11, 1972, abandoned. This application Apr. 17, 1975, Ser. No. 568,935

Claims priority, application United Kingdom, Oct. 12, 1971, 47471/71

Int. Cl.² B29C *27/20*

U.S. Cl. 156—86 20 Claims

1. A method of covering a substrate, which comprises applying to the substrate a heat shrinkable tape in overlapping relation, said tape comprising a cross-linked copolymer formed from an ethylenically unsaturated hydrocarbon and a carboxylic acid ester having ethylenic unsaturation said tape having the property of adhesively bonding to itself upon heating, and heating the tape to cause it to shrink about the substrate and the overlapping layers to adhesively bond to each other.

4,001,066

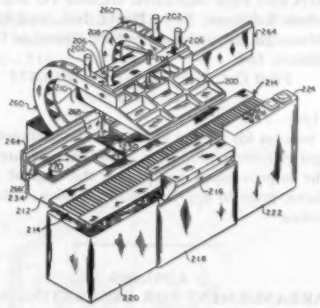
INTERCHANGE AND ALIGNMENT APPARATUS AND METHOD FOR HEATED PLATEN HEAT SEALING MACHINE

Harry M. Channing, Wyomissing, and William J. Eberle, Reading, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed June 24, 1975, Ser. No. 589,680

Int. Cl.² B30B *15/34;* C09J *5/00*

U.S. Cl. 156—152 13 Claims



12. A heat sealing machine for sealing any of a variety of sizes of battery cover and cases, comprising:

a. a plurality of platens, one for each size of battery cover and case to be sealed;

b. carriage means for moving one of said plurality of platens mounted thereon between a first position wherein said platen is disposed between said case and cover to be sealed, and a second position wherein said case and cover may be directly pressed together;

c. means for bringing said platen in said first position into engagement with at least a portion of said case and a portion of said cover; and

d. separate platen interchange means for sliding a preselected one of said plurality of platens onto said carriage means.

4,001,067

BUTT WELDER CUTTING ELEMENT TEMPERATURE CONTROL

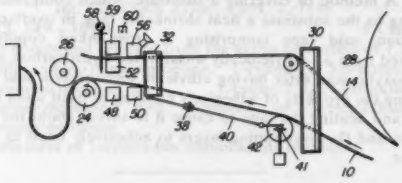
David Emil Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,446

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² B31F *5/00*; **B65H** *19/08*

U.S. Cl. 156—159 **6 Claims**



1. In an apparatus comprising means for feeding a first thermoplastic sheet into the nip of a pair of rolls; drive means operating said rolls drawing said first sheet into proximity to said first sheet and said pair of rolls; clamp means associated with said second sheet; clamp means associated with said first sheet; electrical conductive heating and cutting means proximate to said clamp means movably positioned to pass through both said first and said second sheets, thereby severing said first and second sheets; gate means adopted to allow said heating and cutting means to move in and out of a heat insulating enclosure; and means for contacting the thus severed, hot edges for a time sufficient to weld said first and second edges together; the improvement comprising a gate means which comprises adjacent sections of a flexible material adapted to allow said heating and cutting means to pass through said flexible material comprising said gate, thereby preventing residual thermoplastic build-up.

4,001,068

PROCESS FOR SEALING GLASS TO METAL

Glenn Nelson Robinson, Terre Haute, Ind., and Louis A. Jurisch, Marengo, Ill., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 2, 1975, Ser. No. 618,873

Int. Cl.² C09J *5/04*

U.S. Cl. 156—315 **12 Claims**

1. In a process for joining glass-to-metal surfaces by placing a non-rigid polymeric adhesive between said surfaces to be joined, the improvement comprising the step of applying to said surfaces, prior to applying said adhesive, a methylolated polyoxazoline.

4,001,069

ARRANGEMENT FOR GENERATING AND CONSTRUCTING THREE-DIMENSIONAL SURFACES AND BODIES

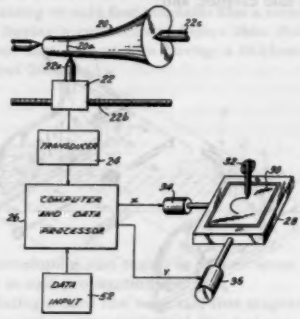
Paul L. DiMatteo, Huntington, N.Y., assignor to Dynell Electronics Corporation, Melville, N.Y.

Division of Ser. No. 516,373, Oct. 21, 1974, Pat. No. 3,932,923. This application Aug. 27, 1975, Ser. No. 608,033

Int. Cl.² B26D *5/00*

U.S. Cl. 156—353 **12 Claims**

1. An arrangement for constructing a predetermined surface comprising, in combination, means for defining a surface in terms of coordinates in space; means for defining a plurality of cross-sections of said surface in terms of planar coordinates from said coordinates in space, said cross-section lying in parallel planes; means for cutting planar elements from planar sheets for each of said cross-sections; means for directing said cutting means dependent on said planar coordinates, each said element having a cross-section corresponding to the respective cross-section of said defined surface; and means for stacking the cut elements adjacent one another in predetermined



sequence to form said surface, the sequence of the stacked cut elements corresponding to the sequence of said plurality of cross-sections of said defined surface.

4,001,070

TIRE BUILDING APPARATUS

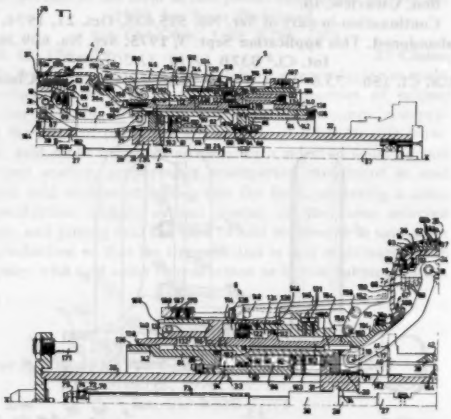
Robert Graham Bell, Hartlebury, England, assignor to National-Standard Company, Limited, Kidderminster, England

Continuation of Ser. No. 450,677, March 13, 1974, abandoned. This application Oct. 23, 1975, Ser. No. 625,189

Claims priority, application United Kingdom, June 15, 1973, 28522/73

Int. Cl.² B29H *17/26*

U.S. Cl. 156—398 **8 Claims**



1. A tyre building apparatus comprising an expandable former embodying axially movable former expanding and contracting means to dispose the former in positions defining firm supporting surfaces of different radii, said expanding and contracting means ensuring symmetrical expansion and contraction of the former with respect to a transverse plane of the former, tyre bead core locating and supporting means disposed on opposite sides of said transverse plane and axially movable independently of the axial movements of said former expanding and contracting means, further means ensuring that axial movements of the two bead core locating and supporting means occur symmetrically at all times with respect to said transverse plane, axially movable, first fluid pressure-actuated means for effecting adjustment of the axial position of said tyre bead locating and supporting means independently of the

degree of expansion of the former, whereby a desired tensioning of the components of a tyre mounted on the former can be achieved whilst maintaining said components symmetrically disposed on the former with respect to said transverse plane, second fluid pressure actuated means axially movable with respect to said first fluid pressure actuated means for effecting radial movement of the tyre bead core locating and supporting means from an inner position to a radially outer position which remains constant independent of the degree of expansion of the former, and adjustable stop means comprising manually adjustable, interengaged first and second screw-threaded means carried by at least one of said fluid-pressure actuated means for the purpose of providing a positive limit to the relative axial movement between said first and second fluid-pressure actuated means, whereby said radially outer position of the tyre bead core locating and supporting means may be accurately determined.

4,001,071
CARPET MACHINE

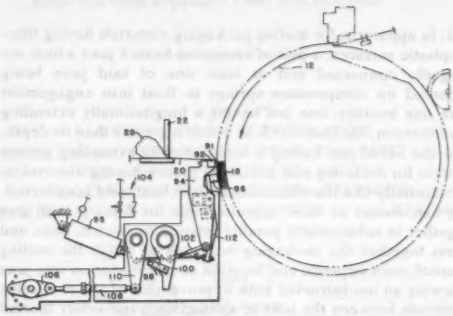
Charles A. Wethington, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed June 8, 1974, Ser. No. 475,385

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² D04H *11/08*

U.S. Cl. 156—435 **3 Claims**



1. Apparatus to produce a bonded pile fabric comprising: a rotor, means to rotate said rotor, a set of blade members slidably mounted in said rotor, a second blade member slidably mounted with respect to said rotor and operably associated with said blade members in said rotor, means to supply yarn between said set of blade members and said second blade member, means to slide said second blade member downwardly at a predetermined time to bend the yarn over one blade of said set of blades, means to slide upwardly the blade of said set of blades next adjacent to the blade over which the yarn is bent to form a loop in said yarn, an elongated backing material guiding means spaced from and supplying an adhesive backed backing material into contact with said formed loop, and means operably associated with said elongated guiding means to move and hold said elongate guiding means and the backing material against the previously formed loops when the machine has stopped.

4,001,072
APPLICATOR FOR PRESSURE-SENSITIVE ADHESIVE FASTENERS

Richard P. deNeui, Lake Elmoin, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 13, 1972, Ser. No. 288,757

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B32B *31/00*; **B31F** *1/00*

U.S. Cl. 156—461 **5 Claims**

1. An applicator for cutting lengths of pressure-sensitive adhesive tape and applying the same to an article moving along a first path, said applicator comprising:

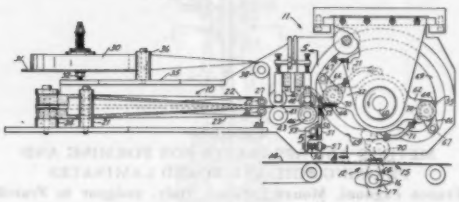
means for feeding a length of said tape along a second path,

a cutting edge disposed on one side of said second path,

vacuum pad means for supporting a severed length of tape, said vacuum pad means comprising a generally rectangular pad,

cutting means movable with said pad means and cooperating with said cutting edge to sever a length of said tape,

mounting means for supporting said vacuum pad means and said cutting means for movement relative to said cutting edge and for moving said pad means along a third orbital path around an axis past said cutting edge to place the



severed lengths of said tape on said pad means and for orienting said pad means to a position generally parallel to and along said first path to apply said severed length of tape to a said article, said mounting means comprising a rotating arm movably supporting said pad means, means for rotating said arm about said axis, and cam means for orientating said pad means during rotation of said arm and for defining said third orbital path, and

wherein said cutting means is mounted on said arm to move with said pad means and to cooperate with said cutting edge to cut sections from said tape.

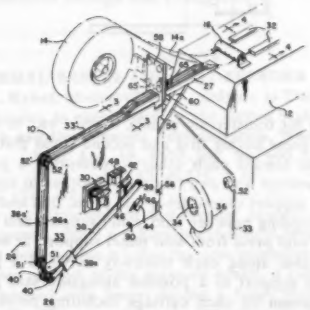
4,001,073
APPARATUS FOR PRODUCING INDIVIDUAL PHOTOGRAPHIC PRINTS WITH STRIP ADHESIVE BACKING

Herman L. Jones, 7302 84th St. NE., Marysville, and John H. Haugen, 9925 Davies Road, Lake Stevens, both of Wash. 98270

Filed Sept. 12, 1974, Ser. No. 505,253

Int. Cl.² B32B *31/00*; **B31F** *5/00*

U.S. Cl. 156—516 **29 Claims**



1. Apparatus for dispensing a continuous strip of adhesive transfer tape composed of a transferable pressure sensitive adhesive layer and a releasable backing strip, for progressive application to the back of a continuous strip of photographic film prints as the latter is drawn intermittantly into a film cutter, the apparatus comprising: means for dispensing a strip of adhesive transfer tape from an adhesive transfer tape roll and for directing the tape strip into a course of travel aligned with the direction of travel to be taken by a film print strip as it enters a film cutter; guide means providing an elongated

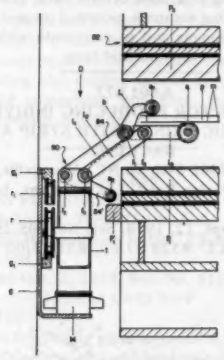
path in said course of travel along which the tape strip is confined and guided into superimposed registry with the back of the photographic print strip, so as to bring progressively the adhesive layer of the dispensed tape strip and the back of the photographic print strip into face to face engagement with each other as they are drawn conjointly into the film cutter.

4,001,074

METHOD AND APPARATUS FOR FORMING AND PRESSING FOIL AND BOARD LAMINATES

Franco Pagnoni, Monza (Milan), Italy, assignor to Fratelli Pagnoni S.p.A., Monza, Milan, Italy

Filed Sept. 30, 1975, Ser. No. 618,115
Claims priority, application Italy, Feb. 7, 1975, 20054/75
Int. Cl.² B32B *31/00;* **B30B** *15/30*
U.S. Cl. 156—580 **8 Claims**



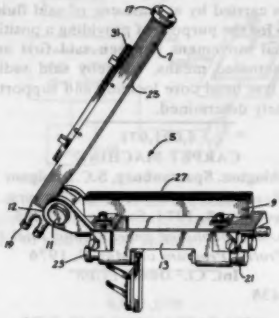
1. A device for transferring panels, boards, etc. to a press, comprising a press having first and second press plates relatively movable toward each other to compress a panel or board therebetween and away from each other to open said press, a panel support spaced from said press, first and second trackways extending between said panel support and the opposite end of said press from said panel support, at least one carriage movable along each trackway between a position alongside said support to a position alongside said press, a pickup mechanism on each carriage including pivotal lever means including a lever pivotal on said carriage toward and away from said panel support and said press and having a support surface engageable below the panel to support it, means to move said carriage, shifting means to shift said lever means and said lever to shift the support surface thereof below said panel for support of the panel thereon, said carriage being movable with said lever means to carry said panel supported thereon to said press, and actuator means associated with said press and responsive to relative closing movement of said first and second press plates to actuate said shifting means to move said lever with said support surface gradually outwardly of said press during closing movement of said press.

4,001,075

SEAL FOR PACKAGES CAPABLE OF THERMOPLASTIC SEALING AND MEANS FOR EFFECTING SUCH SEALING

Donald F. Menzner, and Robert L. Knauf, both of Marathon, Wis., assignors to Marathon Cheese Corporation, Marathon, Wis.

Filed Nov. 20, 1974, Ser. No. 525,577
Int. Cl.² B32B *31/00;* **B30B** *15/34*
U.S. Cl. 156—581 **4 Claims**



1. In apparatus for sealing packaging materials having thermoplastic surfaces, a pair of elongated heated jaws which are hingedly connected and at least one of said jaws being mounted on compression springs to float into engagement with one another, one jaw having a longitudinally extending land thereon, the face width of which is greater than its depth, and the other jaw having a longitudinally extending groove therein for receiving said land, said groove having dimensions substantially like the dimensions of the land, said jaws including cam means at their opposite ends for forcing said jaws together in substantially parallel relation to stretch, heat, and press together the packaging materials to effect the sealing thereof, such opposite end location of said means on said jaws allowing an unobstructed path of movement of the packaging materials between the jaws in a direction transversely thereof when the jaws are open.

4,001,076

METHOD FOR GROWING THIN EPITAXIAL LAYERS OF A NON-LINEAR, OPTICALLY ACTIVE MATERIAL

Lawrence B. Robinson, Cambridge, and William Powazinik, Marlboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 11, 1974, Ser. No. 531,570
Int. Cl.² B01J *17/20;* **C01D** *11/02;* **C01G** *35/00, 57/00*
U.S. Cl. 156—624 **23 Claims**

1. A method for growing thin single crystal epitaxial layers of a non-linear, optially active material on a lithium tantalate or lithium niobate substrate comprising:

a. providing a solution of said non-linear, optically active material represented by the formula $M_xM'_{(1-x)}NO_3$ or $MN_xN'_{(1-x)}O_3$, where M and M′ are independently alkali metals, and N and N′ are independently niobium and tantalum and x can be any value from 0 to 1, inclusive, in a molten alkali metal halide solvent;

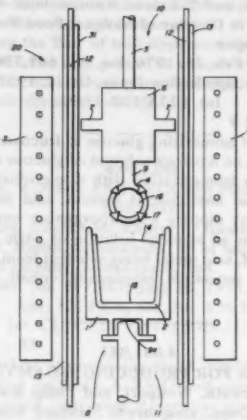
b. heating said solution to an elevated temperature to produce saturation of said non-linear, optically active material in said solvent, with an excess of said non-linear, optically active material remaining undissolved in said solvent;

c. slowly evaporating a portion of said solvent to induce a super-saturated condition in said solution;

d. heating said substrate to a temperature approximately equal to that of said solution;

e. bringing said substrate into contact with said solution; and

f. removing said substrate from said solution after a predetermined time interval during which said thin single crys-



tal epitaxial layer of said non-linear, optically active material has been deposited upon said substrate.

4,001,077

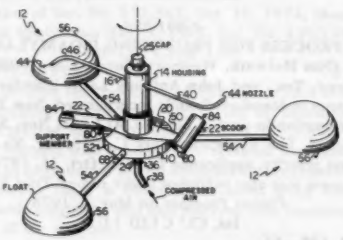
EVAPORATION ACCELERATOR

Orville Kemper, 455 Huntridgre, Moab, Utah 84532

Filed Feb. 27, 1976, Ser. No. 662,214

Int. Cl.² B01D *1/16;* **F23D** *11/04;* **B01D** *47/16*

U.S. Cl. 159—4 S **12 Claims**



1. An evaporation accelerator comprising:

a base;

float means connected to said base to float said evaporation accelerator in an evaporatable liquid;

a housing rotatably secured to said base to extend upward therefrom;

air operated propulsion means connected to said housing to rotate said housing;

air supply means connected to supply compressed air to said propulsion means;

support members secured to said housing to extend generally radially therefrom;

scoop means secured to the free outer ends of said support members generally perpendicularly thereto, said scoop means being angularly positioned with respect to the horizontal to have a first depressed end positioned into said liquid and a second elevated end positioned above the surface of said float so that as said housing and in turn said scoop means are rotated by said propulsion means, fluid is scooped up by said scoop means at said first end and ejected over the surface of said fluid at said second end.

4,001,078

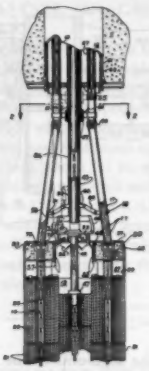
CONTROL APPARATUS

David W. Doll, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Mar. 7, 1975, Ser. No. 556,318

Int. Cl.² G21C *7/08*

U.S. Cl. 176—35 **6 Claims**



1. In a nuclear reactor system having a pressure vessel with at least one penetration therein, and a core region enclosed by the pressure vessel and in which a plurality of control rod guide holes are distributed over an area larger than the cross section of the penetration, control apparatus comprising, a plurality of flexible control rods, one for each of said guide holes for insertion therein, a plurality of originally parallel guide tubes extending from said penetration and fanning out to respective ones of said guide holes for guiding said control rods from said penetration to said guide holes, an intermediate portion of each of said guide tubes including flexible means to permit said fanning out, means for moving said control rods through said guide tubes and into and out of said guide holes, and means for withdrawing said guide tubes from said guide holes and displacing the more widely fanned out spaced ends of said guide tubes to bring said tubes into parallel alignment for withdrawal through said penetration.

4,001,079

THERMAL BAFFLE FOR FAST-BREEDER REACTON

John A. Rylatt, Monroeville, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

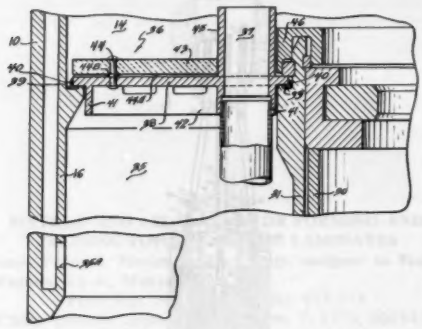
Filed Aug. 15, 1975, Ser. No. 605,371

Int. Cl.² G21C *3/22*

U.S. Cl. 176—87 **3 Claims**

1. In a sodium-cooled fast-breeder reactor comprising a core disposed within a generally cylindrical pressure vessel, a thermal liner having a ledge thereon immediately interior of the upper portion of the pressure vessel, a cylindrical vertically disposed core barrel having a ledge thereon disposed surrounding the core within the pressure vessel, an inlet plenum disposed in the lower portion of the pressure vessel below the core, a plurality of inlet nozzles communicating with said inlet plenum, an outlet plenum in the upper portion of the pressure vessel above the core, a plurality of outlet nozzles communicating with said outlet plenum, a conical skirt connecting the lower end of the core barrel with the pressure vessel, means for bypassing a relatively low volume of coolant past the core and through the annulus between the core barrel and the pressure vessel to the outlet nozzles, and a horizontal thermal baffle extending between the top of the core barrel and resting on the ledge thereon and the thermal liner and

resting on the ledge thereon to separate the hot coolant in the outlet plenum from the relatively cool coolant in the bypass coolant annulus, the improvement wherein said thermal baffle comprises a bridge structure consisting of an austenitic stainless steel baffle plate, a segmented austenitic stainless steel insulating plate covering the upper surface of said baffle plate, tie-down pins spacing the segments of the insulating plate from the baffle plate and fastening them thereto to allow



sufficient motion of the segments of the insulating plate relative to the baffle plate for the free thermal bow of each separate segment, flex seals extending between the edge of the baffle plate and the ledges on the core barrel and thermal liner to prevent sodium of different temperatures from washing therethrough, said thermal baffle being keyed to the core barrel to move therewith and being floating with respect to the thermal liner and pressure vessel.

4,001,080

PRODUCTION OF IMMUNOLOGICAL MATERIALS

Jean Michel Goust, and Robert Louis Moulias, both of Paris, France, assignors to Piktor Limited, Paris, France

Continuation-in-part of Ser. No. 407,192, Oct. 17, 1973, abandoned. This application May 5, 1975, Ser. No. 574,256

Claims priority, application United Kingdom, Oct. 20, 1972, 48486/72

Int. Cl.² C12K *9/00*

U.S. Cl. 195—1.8 **3 Claims**

1. A process for the in vitro production of transfer factor comprising:

culturing in vitro at least one strain of lymphoblastoid cells in the presence of added transfer factor to propagate the cells and induce the production of transfer factor by them; and

extracting the produced transfer factor.

4,001,081

PROCESS FOR THE PREPARATION OF AMIDES BY BIOLOGICAL HYDROLYSIS

Auguste Commeyras, Clapier; Alain Arnaud, Clermont L'Herault; Pierre Galzy, and Jean-Claude Jallageas, both of Montpellier, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Dec. 17, 1975, Ser. No. 641,774

Claims priority, application France, Dec. 18, 1974, 74.41828

Int. Cl.² C12D *13/06*

U.S. Cl. 195—29 **12 Claims**

1. A process for the preparation of an amide by hydrolysis of the corresponding nitrile, characterized in that the said nitrile in aqueous solution is subjected to the action of bacteria having a nitrilasic activity, in that the pH of the said aqueous solution is maintained at a value at least equal to the limiting pH of the amide hydrolysis reaction, then in that the bacteria mass is separated from the amide solution.

4,001,082

METHOD OF ISOMERIZING GLUCOSE WITH ENZYME IMMOBILIZED WITHIN MICROBIAL CELL

Nobuzo Tsumura, and Takafumi Kasumi, both of Tokyo, Japan, assignors to Director of National Food Research Institute, Tokyo, Japan

Filed Feb. 26, 1976, Ser. No. 661,730

Claims priority, application Japan, Oct. 2, 1975, 50-118262

Int. Cl.² C12D *13/02*

U.S. Cl. 195—31 F **22 Claims**

1. A method of isomerizing glucose to fructose which comprises contacting an aqueous solution of glucose under conditions suitable for isomerization with a microbial cell having glucose isomerase immobilized therein, said microbial cell being prepared by dipping a microorganism containing glucose isomerase in an aqueous solution of citric acid or of a metal salt thereof, said metal being selected from the group of lithium, sodium, potassium, magnesium, cobalt, calcium and mixtures thereof.

4,001,083

PROCESS FOR PRODUCING ISOAMYLASE

Robert Otto Horwath, Westport, and Philip Rotheim, Stamford, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 395,501, Sept. 10, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,585

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C12D *13/10*

U.S. Cl. 195—65 **10 Claims**

1. A process for producing isoamylase comprising propagating microorganisms which produce isoamylase in an aqueous nutrient medium having present an amount of maltitol sufficient to increase the amount of isoamylase produced over the amount of isoamylase produced by propagating the microorganisms without the presence of maltitol.

4,001,084

PROCESS FOR PRODUCING ISOAMYLASE

Robert Otto Horwath, Westport, Conn.; Gary William Cole, Garland, Tex., and John Anthony Lally, Stamford, Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 413,121, Nov. 5, 1973, abandoned. This application July 1, 1975, Ser. No. 592,146

Claims priority, application Canada, Oct. 31, 1974, 212750

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C12D *13/10*

U.S. Cl. 195—65 **9 Claims**

1. A process for producing isoamylase, comprising propagating Flavobacterium sp. ATCC 21918 under aerobic conditions in an aqueous nutrient medium having present a suitable carbon source. .

4,001,085

IMMOBILIZATION OF ENZYMES ON AN INORGANIC MATRIX

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 10, 1973, Ser. No. 395,975

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07G *7/02*

U.S. Cl. 195—68 **8 Claims**

1. A process for depositing and immobilizing an enzyme on an inert, inorganic, porous, sorptive, dimensionally stable, liquid permeable metal oxide supporting matrix having been formed by compacting and sintering a refractory metal oxide powder, said matrix being sufficiently porous to be enzyme and substrate permeable, and having a porosity in the range of about 10 percent to about 80 percent and an average pore

diameter in the range of about 0.01 to 10 microns, said process comprising contacting an aqueous dispersion of said enzyme with said matrix, applying at least about 10 psig pressure to said dispersion to cause substantial amounts of said dispersion to flow through said matrix,

maintaining the flow of said dispersion through said matrix for a sufficient time period of at least about 5 minutes to immobilize said enzyme directly on said matrix to form an enzymatically active composite.

4,001,086

ANTIBIOTIC A-30641 AND PROCESS FOR PRODUCTION THEREOF

David H. Berg, Greenfield; Robert L. Hamill, New Ross, and Marvin M. Hoehn, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 597,047, July 18, 1975. This application Apr. 12, 1976, Ser. No. 676,184

Int. Cl.² C12D *9/14*; C07D *285/00*

U.S. Cl. 195—81 **3 Claims**

1. The method of producing the A-30641 antibiotic complex comprising antibiotic A-30641 and canadensolide which method comprises cultivating *Aspergillus tamarii* NRRL 8101 in a culture medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced by said organism in said culture medium and separating the A-30641 antibiotic complex from said culture medium.

4,001,087

AFFINITY LABELLING ENZYMES WITH ESTERS OF AROMATIC SULFONIC ACIDS

Show-Chu Wong, Riverhead, and Elliott Shaw, Shoreham, both of N.Y., assignors to The United States of America, Washington, D.C.

Continuation of Ser. No. 513,565, Oct. 10, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,133

Int. Cl.² C12K *1/00*

U.S. Cl. 195—103.5 R **2 Claims**

1. In a method for the study of enzymes which comprises affinity labelling enzymes for identifying or inhibiting their functional groups, the improvement which comprises reacting a purified enzyme with a compound selected from the group consisting of nitrophenyl p- and m-amidinophenylmethanesulfonate whereby there is obtained covalent bond formation between said compound and said enzyme with inactivation or inhibition of the enzyme.

4,001,088

METHOD FOR THE DETERMINATION OF CREATINE PHOSPHOKINASE ENZYME

Alan S. Antonik, 599 Exmoor Road, Elk Grove Village, Ill. 60007

Filed Aug. 2, 1974, Ser. No. 493,874

Int. Cl.² C12K *1/04*; G01N *33/00*

U.S. Cl. 195—103.5 R **1 Claim**

1. A test reagent useful for the quantitative determination of the enzyme creatine phosphokinase in an organism, thereby to ascertain the presence of normal and pathologically significant excessive concentrational levels of the enzyme in the organism,

said reagent being operative to produce upon addition to and reaction with specimens of dried blood and dried tears measurable bioluminescent light the intensity of which is a determinable function of the concentration of creatine phosphokinase contained in the specimens, said reagent consisting essentially of:

a. firefly lantern extract and

b. creatine phosphate.

4,001,089

METHOD FOR DETERMINATION OF TRIGLYCERIDES AND GLYCEROL

William S. Stavropoulos, Carmel, and Robert D. Crouch, Indianapolis, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 20, 1974, Ser. No. 452,879

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C12K *1/04*; G01N *31/00*

U.S. Cl. 195—103.5 R **11 Claims**

1. In a method for determination of triglycerides in biological fluids by hydrolyzing the triglycerides to produce glycerol and quantitatively analyzing the hydrolysis mixture to determine the glycerol content, the improvement which comprises mixing a biological fluid which contains phospholipids with an alkali metal hydroxide and methanol to provide a hydrolysis mixture containing from about 75 to about 99.8 percent by weight of the methanol and an alkali metal hydroxide concentration of from about 0.15 to about 0.45 Normal; holding the resulting hydrolysis mixture for a time of from about 1 to about 20 minutes sufficient to hydrolyze triglycerides, and thereafter quantitatively determining the glycerol content of the resulting hydrolysis mixture.

4,001,090

PROCESS AND APPARATUS FOR THE CULTURE OF MICROORGANISMS

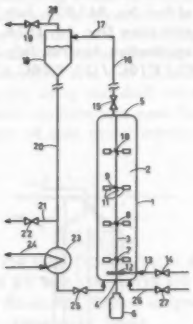
Vladimir Kalina, Lausanne, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 27, 1975, Ser. No. 580,744

Claims priority, application Switzerland, May 28, 1974, 7249/74

Int. Cl.² C12B *1/14*, *1/16*

U.S. Cl. 195—109 **13 Claims**



1. A process for the aerobic culture of a microorganism in a fluid nutrient medium therefor containing at least one source of carbon assimilable by the microorganism, comprising

circulating a culture broth consisting of the fluid nutrient medium and a cellular mass of the microorganism in a closed loop flow course having ascending and descending sides extending between upper and lower levels of said closed loop, there being a fermentation zone extending upwardly along the ascending side of the loop from said loop lower level and having a top terminating below said loop upper level,

subjecting said culture broth while flowing through said fermentation zone to the combined action of

the frictional forces of bubbles of an oxygen containing gas or of oxygen released under pressure into the broth,

a mechanical force applying an upward thrust to the culture broth, and

at least one couple of mechanical forces acting on the broth in a horizontal plane, and

imposing a back pressure on the culture broth at the top of the fermentation zone whereby the pressure prevailing at the top of the fermentation zone is maintained at a higher value than the pressure prevailing at the said upper level of said loop.

5. Apparatus for the aerobic culture of microorganisms, comprising

means defining a closed loop flow course wherein a culture broth can be circulated, said closed loop having ascending and descending sides thereof and communicating with each other at respective upper and lower loop levels,

means defining a fermentation chamber in the ascending side of said loop, said fermentation chamber extending upwardly a distance from said loop lower level and having a top disposed a distance below said loop upper level,

means for injecting gas under pressure into said fermentation chamber at the lower end thereof,

means for mechanically propelling culture broth upwardly from the lower end of said fermentation chamber,

means for applying at least one couple of mechanical forces acting in a horizontal plane on broth in said fermentation chamber, and

means for imposing a back pressure on the culture broth at the top of said fermentation chamber whereby the pressure at the top of said fermentation chamber is maintained at a higher value than the pressure prevailing at the upper level of said loop.

4,001,091

ASPHALT BLOWING VESSEL

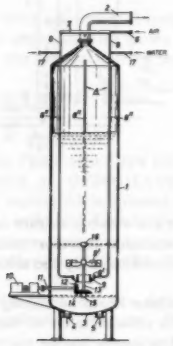
Hans Senolt; Heinrich Tomaschko, and Georg Palvik, all of Vienna, Austria, assignors to Osterreichische Mineralolverwaltung Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 306,820, Nov. 15, 1972, abandoned, which is a division of Ser. No. 843,970, July 23, 1969, Pat. No. 3,773,649. This application Dec. 16, 1974, Ser. No. 532,823

Claims priority, application Austria, July 25, 1968, 7210/68

Int. Cl.² C10C *1/20*; C10G *17/00*

U.S. Cl. 196—46 **3 Claims**



1. In a system for blowing a molten bitumen residue, comprising: a blowing vessel including means for introducing a bitumen distillation residue and removing a converted residue and maintaining a level of the residue being treated in the vessel with a space thereabove, said vessel including an exhaust line at an upper portion thereof for communicating with the space above the level of molten residue maintained in the vessel, the improvement including air-line means for introducing air into said vessel below the surface of the residue, said air-line means extending into the vessel through the space above the residue in the vessel and being immersed therein over a substantial portion thereof in the molten residue in heat-exchanging relationship, said air-line means opening into the vessel for discharging air substantially below the surface of the molten residue maintained therein; water-inlet means connected to the air-line means above the residue level substantially upstream of said air-line means opening introducing water traversing the air-line means with wet air and in a heat-exchanging relationship along said air-inlet means within the molten residue so that the water is evaporated and combines with the air in said air-line means before discharge beneath the surface of the molten bitumen residue, the sizes of the air-line means and water-inlet means and heat-exchanging portions being proportioned so that evaporation of the water in said air-line means is substantially complete before discharge beneath the surface of the molten bitumen residue so that the temperature of the distillation residue is controlled, a masking blanket of steam forms over the surface of the bitumen residue contained within the vessel and reaction and foaming at the surface of the bitumen residue is minimized within the vessel, while stripping off of undesired reaction by-products is enhanced and waste product vapors are removed from the vessel through said exhaust line and are diluted, said air-line means downstream of said water-inlet means comprising a plurality of enlongated tubes depending into said vessel, said tubes being impervious and opening at their distal ends, said vessel being substantially elongated and extending vertically, said air and steam distributor means including an annular ring element disposed axially of the vessel, the tubes having their open ends directed toward the outer surface of the annular ring for dispersing the mixture of steam and air beneath the surface of the molten residue.

4,001,092

CHARGING CAR FOR COKE OVENS

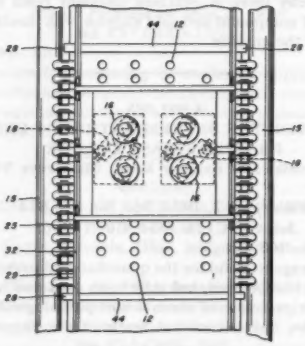
Erich Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Aug. 22, 1975, Ser. No. 606,853

Claims priority, application Germany, Nov. 8, 1974, 2452975

Int. Cl.² C10B *35/00*, *27/04*; B66C *17/08*; F23K *3/00*

U.S. Cl. 202—262 **10 Claims**



1. A coal charging apparatus adapted to move along the top of a battery of coke ovens wherein the roof for each coking chamber includes a row of spaced-apart charging holes which are aligned in a parallel relation with the longitudinal axis of the coking chamber, the row of charging holes being covered by lids which are removable to feed a charge of coal into the coking chamber, said coal charging apparatus comprising the combination of:

a charging car adapted to move along the roof of the battery of coke ovens from oven-to-oven while spaced above the charging holes for each coking chamber,

a plurality of hoppers which essentially includes a hopper for supplying coal to each charging hole lying within an aligned row thereof for a given coking chamber, said plurality of hoppers being supported by said charging car in a manner such that two hoppers for supplying coal to adjacent charging holes within a given row thereof are supported one after the other in a substantially consecutive relationship extending parallel to the direction of movement of the charging car along the coke ovens,

a charging tube for each of said plurality of hoppers for directing coal into a charging hole, and

conveyor means for each charging tube for conducting coal thereto from one of said plurality of hoppers.

4,001,093

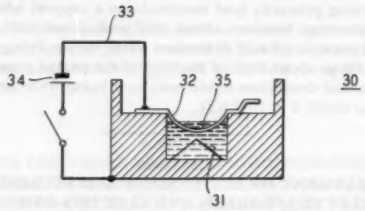
METHOD OF ELECTROPLATING PRECIOUS METALS IN LOCALIZED AREAS

Donald Eldridge Koontz, and Uziel Landau, both of Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 6, 1975, Ser. No. 602,254

Int. Cl.² C25D *5/02*

U.S. Cl. 204—15 **17 Claims**



1. A process for the fabrication of articles in which a precious metal is electroplated on at least one surface comprising the steps of

a. assembling a metal plating cell with an anode-cathode separation distance of a single anode and a single cathode, anode and surface to be plated;

b. pumping metal plating solution of a given composition and temperature between the freezing point and boiling point of the metal plating solution through the metal plating cell thereby producing a given parallel flow rate with anode and cathode in stationary positions;

c. passing current through electrodes of the metal plating cell at a given current density so as to plate metal onto the surface to be plated CHARACTERIZED IN THAT the minimum electrode separation distance is less than about 0.5 inches, the ratio between longest and shortest anode-cathode separation distance of a single anode and a single cathode is at least two to one; the parallel flow rate of the metal plating solution is at least 50 centimeters per second and the plating rate in terms of current density is at least 100 milliamperes per cm^2.

4,001,094

METHOD FOR INCREMENTAL ELECTRO-PROCESSING OF LARGE AREAS

John F. Jumer, 16 W. 131 Timber Trails Drive, Elmhurst, Ill. 60126

Filed Sept. 19, 1974, Ser. No. 507,534

Int. Cl.² C25F *3/00, 3/16*

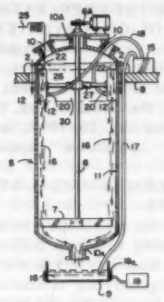
U.S. Cl. 204—129.6 **3 Claims**

1. A method for incrementally electro-polishing the interior metal surface of a stationary vertically oriented vessel having closed ends and a side wall generally concentric about its vertical axis with at least one of said closed ends having an access port, said vessel including an agitator therein positioned on a shaft which is adapted for rotation, and said shaft being mounted along at least a portion of the vertical axis of said vessel, said method comprising the steps of:

removably affixing an extensible arm and processing chamber means on said agitator shaft, said extensible arm being mounted on said shaft, and said processing chamber means being mounted on the distal end of said shaft, and having a first face opening for sequentially masking increments of said metal surface to be electro-polished;

extending said extensible arm until a sealing means at the edges of said first face opening substantially sealingly engage an increment of said metal surface;

introducing and maintaining an electrolyte in said processing chamber means;



supplying current to an ungrounded electrode forming a cathode positioned in said processing chamber means which is in communication with said electrolyte positioned therein to electro-polish said metal surface increment;

rotating said processing chamber unit laterally around the interior of said vessel to a position on said metal surface where at least a portion of a surface increment forming a wall of said chamber unit is unpolished; and

moving said extensible arm and chamber unit connected thereto vertically along said shaft and removably affixing same when said chamber unit open face is contacting at least a portion of said vessel interior surface which is unpolished.

4,001,095

METHOD OF DISCOLORATION OF METAL COMPOUNDS BY IRRADIATION OF LASER RAYS

Eisaku Nakatani, Hiratsuka, Japan, assignor to Kansai Paint Company, Ltd., Amagasaki, Japan

Continuation-in-part of Ser. No. 421,735, Dec. 4, 1973, abandoned. This application May 15, 1975, Ser. No. 577,929

Claims priority, application Japan, Dec. 11, 1972, 47-123377

Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 R **9 Claims**

1. A method of discoloration of a metal compound to form a compound in which the metal has a lower valence or to deposit the metal which comprises rendering semiconductive a metallic compound selected from the group consisting of oxides, sulfides, chromates and titanates of metal elements, and radiating a laser ray on the resulting semiconductive metallic compound, said laser ray having a wavelength from the visible region to the infrared region and an energy density of at least 0.001 milliwatt per square micron for the cross-section at an irradiated spot of said semiconductive metallic compound, the energy dosage being from 0.5×10^{-6} MW sec./$cm.^2$ to 3.0×10^{-3} MW sec./$cm.^2$.

4,001,096

PROCESS FOR PREPARING 25-HYDROXYCHOLECALCIFEROL INTERMEDIATES

William G. Salmond, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,698
Int. Cl.² B01J 1/10; C07G 13/00; C07J 9/00
U.S. Cl. 204—158 R **5 Claims**

1. A method for preparing 9β,10α-cholesta-5,7-diene-3β,25-diol which comprises irradiating cholesta-5,7-diene-3β,25-diol and recovering crystalline 9β,10α-cholesta-5,7-diene-3β,25-diol from the reaction mixture.

5. A method in accordance with claim 4 wherein radiation of wavelength greater than 270–280 mμ is employed.

4,001,097

PROCESS FOR THE PREPARATION OF CURED OLIGOACRYLATES

Takahisa Ogasawara; Yoshimichi Senzaki; Hiroyuki Kato, and Hidemaro Tatemichi, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 314,286, Dec. 12, 1972, abandoned. This application Aug. 29, 1974, Ser. No. 501,714
Claims priority, application Japan, Dec. 16, 1971, 46-101425
Int. Cl.² C08F 8/00; C08L 67/06, 67/00
U.S. Cl. 204—159.16 **2 Claims**

1. A process for the preparation of a cured oligoacrylate which comprises curing, under the action of ionizing radiation having energy of at least 100 Kev in a molecular oxygen-containing gas, an oligoacrylate containing a) 3–6 acryloyl groups; b) at least one cyclohexene nucleus in the molecule; c) an acryloyl group equivalent of not more than 1000; and d) having a boiling point of not lower than 200° C which oligoacrylate is a reaction product prepared by interesterifying a mixture of:

1. acrylic acid;
2. at least one member selected from the group consisting of tetrahydrophthalic acid and anhydride thereof, and
3. at least one member selected from the group consisting of trimethylolpropane and pentaerythritol and then recovering said cured oligoacrylate.

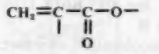
4,001,098

COMPOSITIONS CURABLE BY EXPOSURE TO ULTRA VIOLET LIGHT IN THE PRESENCE OF CHLORO-SUBSTITUTED ACETOPHENONES

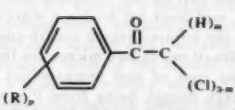
Pieter Dirk Swaters, Lochem; Reginoldus Havinga, Schalkhaar, and Tjerk van der Hauw, Diepenveen, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 427,710, Dec. 26, 1973, abandoned. This application June 30, 1975, Ser. No. 592,020
Int. Cl.² C08F 2/46, 4/00, 2/50, 4/32
U.S. Cl. 204—159.23 **10 Claims**

1. In a process for preparing a composition curable by ultra violet light containing a compound having at least two structural units of the formula:



the improvement which comprises incorporating into the composition a compound having the general formula:



(I)

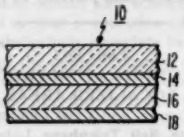
wherein $m = 0$, 1 or 2 and p represents an integer of from 1 to 5 and wherein, when $p = 1$, R represents an alkyl or alkoxy group having at least 4 carbon atoms and, when $p > 1$, R is an alkyl or alkoxy group having together at least 4 carbon atoms in an amount sufficient for curing the composition by ultra violet light.

4,001,099

PHOTOSENSITIVE CAMERA TUBE TARGET PRIMARILY OF LEAD MONOXIDE

Chih Chun Wang, Hightstown; Thomas Clifford Lausman, Cranbury, and Ronald Frank Bates, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,631
Int. Cl.² B01K 1/00; B05D 5/12
U.S. Cl. 204—164 **5 Claims**



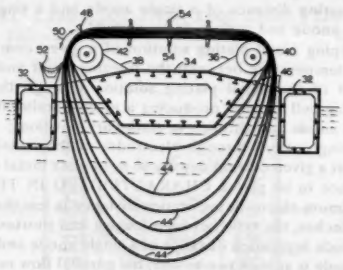
1. A method of manufacturing a photosensitive device comprising the step of vapor depositing in an atmosphere containing oxygen and vapors of deuterium oxide a layer comprising primarily lead monoxide on a support which is at a temperature between about 100° and about 120° C., the partial pressure of said deuterium oxide vapors being initially about 50 to about 80% of the sum of the partial pressures of oxygen and deuterium oxide, said sum being from about 5×10^{-3} to about 2×10^{-2} torr.

4,001,100

TREATMENT OF SUSPENSIONS AND SLURRIES BY ELECTROPHORESIS AND ELECTRO-OSMOSIS

James Livesey Haydock, 20 Victoria St., Toronto, Ontario, Canada

Filed Jan. 3, 1975, Ser. No. 538,328
Int. Cl.² B03C 5/00, 7/08
U.S. Cl. 204—180 R **12 Claims**



1. A method of removing suspended particles from an aqueous suspension, comprising introducing a layer of a suspension of the particles between two generally parallel electrodes of an electrode assembly, setting up a DC electric field between the electrodes whereby to cause electrophoretic migration of the particles to one of said electrodes and electro-osmotic consolidation of the particles at said electrode, and separating from said electrode assembly the migrated particles accumulating at said one electrode, wherein the electrode assembly includes collapsible insulating spacer means separating the electrodes, and the electrode assembly is freed from accumulation of particles by collapsing said spacer means so as to press together said electrodes and squeeze out said particle accumulations.

4,001,101

ELECTRODEPOSITION OF EPOXY COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and a continuation-in-part of Ser. No. 840,848, July 10, 1969, abandoned, and a continuation-in-part of Ser. No. 100,825, Dec. 22, 1970, abandoned, and a continuation-in-part of Ser. No. 100,834, Dec. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned. This application July 29, 1971, Ser. No. 167,470

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.[2] C25D *13/06*

U.S. Cl. 204—181 **19 Claims**

1. A method of coating a conductive substrate serving as a cathode which comprises passing electric current between an anode and said cathode in electrical contact with a water-dispersed composition comprising an aqueous dispersion comprising an ungelled, water-dispersible epoxy resin having in the resin molecule:

a. at least one 1,2-epoxy group,

b. at least about 0.05 percent by weight of chemically-bound nitrogen, at least one percent of which is in the form of a quaternary ammonium base salt of an acid having a dissociation constant greater than about 1×10^{-5},

c. said water-dispersed composition containing boron in the form of boric acid, an ester of boric acid or a compound which can be cleaved to form boric acid in aqueous medium.

4,001,102

PROCESS FOR GENERATING PERIODIC NON-UNIFORM ELECTRIC FIELD, AND FOR REMOVING POLARIZABLE PARTICULATE MATERIAL FROM FLUID, USING FERROELECTRIC APPARATUS

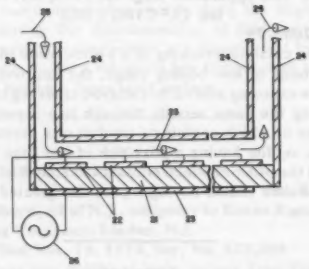
Howard D. Batha, Tonawanda, N.Y., and Leslie E. Cross, State College, Pa., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 348,835, April 6, 1973. This application June 23, 1975, Ser. No. 589,179

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.[2] C25B *7/00*; **B01D** *13/02*

U.S. Cl. 204—186 **2 Claims**



1. A process for generating a period non-uniform electric field, external to field-generating electrodes of the apparatus for generating the periodic non-uniform electric field, in an apparatus comprising

a. a ferroelectric material, polarizable in directions perpendicular to the surface of the ferroelectric material; the ferroelectric material comprising at least one portion, the direction of polarization of which is to be alternated during the generation of the periodic non-uniform electric field, and at least another portion, the direction of polarization of which is to remain the same during the generation of the periodic non-uniform electric field;

b. a plurality of electrodes, applied to opposite sides of the ferroelectric material, covering both sides of the portions of the ferroelectric material, the direction of polarization of which is to be alternated during the generation of the periodic non-uniform electric field, but leaving uncovered at least one side of the portions of the ferroelectric material so as to produce a non-uniform electric field, the direction of polarization of which is to remain the same during generation of the periodic non-uniform electric field, defining a location external to the field-generating electrodes and adjacent the boundary between the alternately polarized portions of the ferroelectric material, in which the periodic non-uniform electric field is to be generated; and

c. means for providing alternating potential to the electrodes

1. for alternating the direction of polarization of the covered portions of the ferroelectric material and leaving polarized in their original direction, the uncovered portions of the ferroelectric material;

2. for producing periodically alternately polarized portions of the ferrolectric material; and

3. for generating a periodic non-uniform electric field external to the field-generating electrodes, in the location adjacent the boundary between the alternately polarized portions of the ferroelectric material, said process comprising providing alternating potential to the electrodes on the ferroelectric material in such a way

a. as to alternate the direction of polarization of the portions of the ferroelectric material, the direction of polarization of which is to be alternated, leaving polarized in their original direction the uncovered portions of the ferroelectric material, the direction of polarization of which is to remain the same;

b. as to produce thereby, periodically, alternately polarized portions of the ferroelectric material; and

c. as to generate thereby, a periodic non-uniform electric field, external to the field-generating electrodes, in the location adjacent the boundary between the alternately polarized portions of the ferroelectric material.

4,001,103

DEVICE FOR THE DETECTION AND MEASUREMENT OF NO AND NO_2 GASES

Keith F. Blurton, Yorktown, N.Y., and John M. Sedlak, Norwalk, Conn., assignors to Energetics Science, Inc., Elmsford, N.Y.

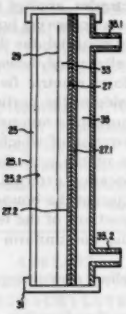
Filed May 7, 1974, Ser. No. 467,671

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 R **9 Claims**

1. An NO_2 detecting and measuring unit comprising in combination an intake means, an electrochemical cell, means for drawing an NO_2 containing gas through said intake means and into said electrochemical cell at a controlled flow rate, read out means for reading the quantity of NO_2 gas described, said electrochemical cell comprising an anode, a cathode, a reference electrode at which substantially no current flows and an aqueous electrolyte in contact with said anode, cathode and reference electrode, means for exposing said cathode to said NO_2 containing gas, means for maintaining said cathode at a fixed potential relative to the reference electrode of about 0.7 V to 1.1 V with respect to a reversible hydrogen potential in said electrolyte, electrical circuitry connected so that the polarity of the cathode to the anode is negative, the

cathode of said electrochemical cell comprising a catalyst capable of catalyzing the electroreduction of NO_2 at said fixed



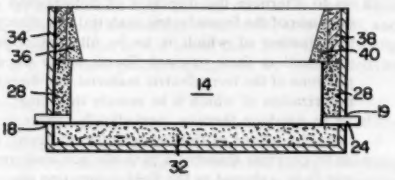
potential bonded to a hydrophobic material to provide a diffusion electrode.

4,001,104

CEMENTED COLLECTOR BAR ASSEMBLIES FOR ALUMINUM CELL CARBON BOTTOM BLOCK

Jostein J. Vadla, Rocky River, and Robert G. Milner, Bay Village, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,385
Int. Cl. C25C *3/08*
U.S. Cl. 204—243 R **10 Claims**



1. An improved method for constructing a conductive, metallic collector bar-carbonaceous block assembly in the cathode bottom of an aluminum reduction cell comprising the steps of:

a. positioning a metallic collector bar within a reduction cell upon the bottom surface thereof, the ends of said bar protruding a predetermined distance through openings in oppositely situated side walls of said cell, and

b. depositing a binder comprising a layer of an electrically conductive, carbonaceous and plastic cement onto the exposed surface of said bar, and

c. positioning a prebaked carbonaceous cathode block having a transverse slot along its length, in the bottom surface thereof, astride said bar to firmly embed such bar within said slot, said slot having a width exceeding the width of said bar and a depth shallower than the height of said bar, said binder securing said bar to said block, the width of said cell measured between said side walls exceeding the length of said block by a distance insufficient to permit removal of said bar-block assembly as a unit from said cell.

4,001,105

HYDROCRACKING PROCESS FOR THE PRODUCTION OF SYNTHETIC FUELS

Phillip H. Gifford, II, Marble Star Route, Carbondale, Colo. 81623

Continuation-in-part of Ser. No. 429,501, Jan. 2, 1974, abandoned. This application Oct. 11, 1974, Ser. No. 514,185
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R **26 Claims**

1. A continuous process for the production of useful products from carbonaceous materials, such as oil shale, coal, tar sands, lignite, or other carbon-containing solids, or heavy carbonaceous liquids, or mixtures thereof, by catalytically hydrocracking said carbonaceous materials, wherein activated spent oil shale, a catalyst which is derived from either raw oil shale or spent oil shale by treating said raw or spent oil shale in the presence of steam under heat and other conditions which promote decomposition of the carbonates found therein, is used to catalyze the hydrocracking reactions to thereby produce relatively low molecular weight hydrocarbon products, the continuous process comprising the following:

a. providing a particulate reactive mass containing activated spent oil shale in a reaction zone of a system for hydrocracking carbonaceous materials;

b. feeding steam and oxygen continuously to the reaction zone, the steam to provide the hydrogen needed for the hydrocracking reactions, and the oxygen to supply the heat duty of the process, these feed gases or their reaction products forming a fluid bed in said reaction zone and also acting as a sweep gas through the reactive mass;

c. feeding continuously to the reaction zone a feed including at least one of said carbonaceous materials and a precursor for activated spent oil shale selected from the group consisting of raw oil shale and spent oil shale as necessary to maintain adequate activated spent oil shale in said reaction zone to catalyze said hydrocracking, while maintaining conditions in the reaction zone which insure the the continued presence of said activated spent oil shale therein, the point of introduction of said carbonaceous materials into said reactive mass being upstream relative to at least some of the activated spent oil shale present;

d. continuously withdrawng relatively low molecular weight hydrocarbon products from the system with the sweep gas; and

e. continuously withdrawing spent material from the system.

4,001,106

CATALYTIC CONVERSION OF HYDROCARBONS

Charles J. Plank, Woodbury, and Edward J. Rosinski, Almonesson, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 548,376, May 9, 1966, Pat. No. 3,769,202, which is a continuation-in-part of Ser. No. 291,585, June 28, 1963, abandoned, and Ser. No. 455,648, May 13, 1965, abandoned, which is a continuation-in-part of Ser. No. 210,215, July 15, 1962, abandoned, and Ser. No. 242,594, Dec. 6, 1962, abandoned, said Ser. No. 291,585, is a continuation-in-part of Ser. No. 210,215, , and Ser. No. 242,594,. This application Aug. 15, 1973, Ser. No. 388,682
Int. Cl.² C10G *37/02*
U.S. Cl. 208—75 **12 Claims**

1. In the catalytic cracking of a hydrocarbon oil to produce hydrocarbons of low boiling range, the improvement which comprises exposing said oil to catalytic cracking conditions by conducting the same serially through two separate reaction zones, one of which contains a catalyst of a crystalline aluminosilicate zeolite having a pore size of less than 7 Angstrom units and the other of which contains a catalyst of a crystalline aluminosilicate zeolite having a pore size greater than 8 Angstrom units.

4,001,107

MORPHOLINONES AS SELECTIVE SOLVENTS FOR AROMATIC HYDROCARBONS

John W. Bozzelli, and George D. Shier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 18, 1975, Ser. No. 588,128
Int. Cl.² C10G *21/16*
U.S. Cl. 208—323 **8 Claims**

1. In a process for recovering aromatic hydrocarbons from a hydrocarbon mixture containing both aromatic and nonaromatic hydrocarbons by liquid-liquid extraction using a selec-

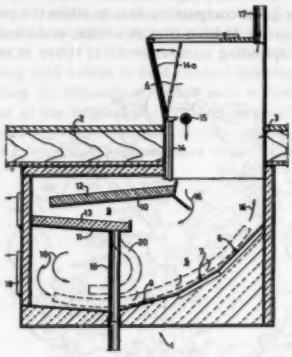
tive solvent, the improvement wherein the selective solvent comprises a morpholinone free of substituents other than lower alkyl groups with a total alkyl carbon content of not more than about 12 carbon atoms.

4,001,108

METHOD FOR NATURAL BIOCHEMICAL DECOMPOSITION OF LATRINE

Åke O. W. Hellqvist, 130 40 Djurhamn, Sweden

Division of Ser. No. 472,634, May 23, 1974, Pat. No. 3,918,106. This application June 23, 1975, Ser. No. 589,251
Claims priority, application Sweden, June 14, 1973, 7308379
Int. Cl.² C02C *1/04*
U.S. Cl. 210—12 **8 Claims**



1. A method of simultaneous decomposition of feces and urine comprising, separating and maintaining the separation of the feces and the urine from the source thereof avoiding intermixture of the feces and urine and decomposing said feces and urine separately at the same time and independent of each other at different temperatures within a single apparatus, the separation of feces and urine being maintained through the largest part of the decomposition process wherein the feces decomposition is accomplished by applying the feces in layers with a vegetary carbon substrate positioned on a sloping bed, maintaining the bed at a temperature of at least 30° C and the percentage of moisture in the feces mixture at 60 to 75%, and permitting the mixture of feces and carbon substrate to move slowly downwards along the sloping plane of the bed during the decomposition of said mixture, and wherein the urine decomposition is accomplished by flowing the urine slowly and at a relatively low temperature through a porous filter having a large total surface.

4,001,109

DEMULSIFICATION PROCESS

Norman N. Li, Edison; Taras Hucal, Iselin, and Robert P. Cahn, Millburn, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 19, 1974, Ser. No. 525,204
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² B01D *13/00, 11/00*
U.S. Cl. 210—22 R **9 Claims**

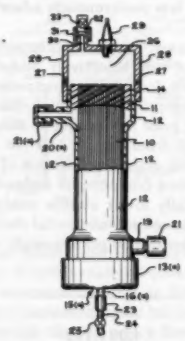
1. In a liquid membrane process for removing a dissolved component from an aqueous feedstream which comprises contacting said feedstream with a water-in-oil emulsion which is characterized as having an exterior phase which is permeable by said dissolved component, an interior phase containing a reagent which reacts with said permeable dissolved component and converts said permeable dissolved component into a non-permeable form, the improvement which comprises contacting said water-in-oil emulsion with said aqueous feedstream for a time and at conditions sufficient to convert a substantial portion of said reagent to the reaction product of said reagent and said dissolved component, separating said water-in-oil emulsion from said aqueous feedstream, demulsifying said water-in-oil emulsion by (1) mixing the emulsion, at a volume ratio of from 1/9 to 9/1, with a mixture of two or more comiscible volatile solvents, at least one of which is an alcohol or a ketone that is miscible with the water and at least one of which is a low boiling hydrocarbon or chlorinated hydrocarbon which is miscible with the oil, the weight ratio of said alcohol or ketone and hydrocarbon being from 1/9 to 9/1 and the oil miscible solvent further characterized as having a boiling point of at least 50°C less than the boiling point of the oil, under conditions of agitation, (2) terminating said agitation and allowing the mixture to separate into an oil and water layer, said water layer comprising substantially all of said reaction product and said unreacted reagent and said oil layer comprising substantially all of the components of the exterior phase of said emulsion, separating said oil and water layers, distilling off said oil miscible solvent from said oil layer, and recycling said oil back to an emulsification zone for use in preparing fresh emulsion.

4,001,110

METHOD FOR THE THERMAL TREATMENT OF TUBULAR DIALYSIS UNITS AND IMPROVED UNITS RESULTING THEREFROM

Henry C. Geen, Brooklyn; Clarence S. Vinton, and Charles H. Franklin, both of Ann Arbor, all of Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Filed Apr. 17, 1975, Ser. No. 569,020
Int. Cl.² B01D *31/00*
U.S. Cl. 210—22 A **12 Claims**



1. The method for cleaning and improving dialyzate fluid flow characteristics in a tubular dialysis unit of the type where multiple tube ends are sealed in place in a manner which provides sharp edged tube lips at end surfaces of the unit to be cleaned which comprises:

a. providing a noncombustible fluid inside the tubes;
b. providing a gas which transiently releases thermal energy upon initiation in contact with the lips without removing the noncombustible fluid from inside the tubes; and
c. initiating the transient thermal energy release in the gas to round the lips of the tubes without rupture of the tubes and to clean the end surfaces of the unit.

4,001,111
DUAL TEMPERATURE GRADIENT ELUTION LIQUID CHROMATOGRAPHY

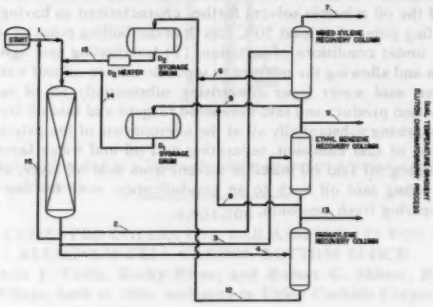
Paul R. Geissler, Edison, and Robert P. Cahn, Millburn, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 19, 1974, Ser. No. 452,501

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B01D *15/08*

U.S. Cl. 210—24 **10 Claims**



1. In a liquid chromatographic separation process of up to two components contained in admixture in a feedstream including the steps of:

a. contacting the feedstream mixture containing said components to be separated with a bed of crystalline aluminosilicate adsorbent at conditions to effect the selective retention of up to two of the components by said adsorbent;

b. passing through said bed an eluent selected from the group consisting of aromatics and substituted aromatics;

c. increasing the strength of the eluting agent during the operation of step (b) above to thereby effect desired separation under conditions that cause low elution volume to feed ratios;

d. recovering from said bed a stream or streams containing a portion of the less preferentially adsorbed components; and

e. recovering a stream or streams substantially enhanced in concentration of said selectively adsorbed components relative to other feedstream components wherein the improvement comprises preheating the eluting agent of step (c) above prior to passing it through said bed at temperatures of from about 160° to about 200°C to thereby effect the desired separation of one of said preferentially adsorbed components under conditions resulting in substantially lower elution volume to feed ratios without a corresponding substantial decrease in the separation of the other of said preferentially adsorbed components.

4,001,112
METHOD OF OPERATING A CHROMATOGRAPHIC APPARATUS

Philip Edwin Barker, Eastern Road, Selly Park, Birmingham 29, and Ronald Edward Deeble, 16 Brentford Road, Solihull, both of England

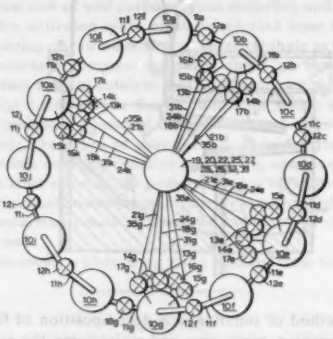
Continuation of Ser. No. 368,584, June 11, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 643,022

Claims priority, application United Kingdom, June 14, 1972, 27786/72

Int. Cl.² B01D *15/08*

U.S. Cl. 210—31 C **5 Claims**

1. A method of operating a chromatographic apparatus for separating a fluid mixture, which apparatus has a plurality of compartments containing a chromatographic packing, conduit means interconnecting the compartments in at least one closed loop series, an isolating valve in each conduit for isolating each compartment from the remaining compartments, a purge fluid inlet for each compartment having a valve therein and adapted to be coupled to a source of purge fluid, a purge fluid outlet for each compartment having a valve therein, a carrier fluid inlet for each compartment having a valve therein and adapted to be coupled to a source of carrier fluid, a carrier fluid outlet for each compartment having a valve therein, and a fluid mixture inlet for each compartment having a valve therein and adapted to be coupled to a source of a fluid mixture to be separated chromatographically, the method comprising sequentially operating said isolating valves for successively isolating said compartments from the other compartments at least one at a time in one direction around said loop, opening the valves of the purge fluid inlets and the purge fluid outlets of the isolated compartment(s) to allow the purge fluid to pass therethrough at least one at a time, and closing them when the corresponding compartment(s) is/are in communication with said other compartments, operating the valves successively to open in said one direction the valves of the carrier fluid inlets of the compartments and the valves of the carrier fluid outlets of the compartments, the outlet valve which is open at any one time being associated with a compartment which is further in said one direction around the closed loop series from the compartment having the inlet valve thereof open, and operating the valves successively to open in said one direction the fluid mixture inlet valves of the compartments, the compartment the fluid mixture inlet valve of which is open being a compartment through which carrier fluid passes between the open carrier fluid inlet and the open carrier fluid outlet valves, and closing the inlet and outlet valves of the remaining compartments, whereby at any instant during the operation, the compartments the carrier fluid inlet and outlet valves of which are open are being respectively fed with a bled of carrier fluid, and the compartment the fluid mixture inlet valve of which is open is being fed with a fluid mixture to be separated while the isolated compartment(s) is/are being supplied with and bled of purge fluid at least one at a time.



4,001,113
ION EXCHANGE METHOD

Karlheinz W. R. Schoenrock, and Hugh G. Rounds, both of Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Continuation of Ser. No. 544,712, Jan. 28, 1975, abandoned, which is a continuation of Ser. No. 356,998, May 3, 1973, abandoned. This application Mar. 2, 1976, Ser. No. 663,200

Int. Cl.² B01D *15/06*

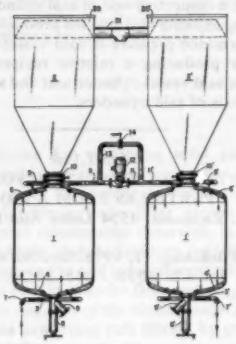
U.S. Cl. 210—33 **3 Claims**

1. A method for conducting an ion exchange operation comprising

a. providing a system comprising at least two pressure vessels connected in series; each of said vessels containing a body of particulate ion exchange material substantially filling said vessel save for sufficient freeboard to allow for the swelling of said exchange material during use; passage means proximate the lower and upper ends of each said vessel providing entrance and exit of fluid to be passed through said vessels whilst retaining within said vessels said bodies of exchange material; each said vessel having a central opening in the top thereof; a non-pressurized expansion chamber located above said vessel and connected to said central opening to allow the entrance of said exchange material from said vessel to said expansion chamber during back wash and drainage of said exchange material back into said vessel after back wash, said central opening being provided with a valve which controls communication between said vessel and said expansion chamber; said expansion chamber being provided with a down take overflow at its top for discharge of back wash water;

b. closing said valves in said central openings,

c. passing an exhaustant liquid into a first said pressure vessel at the bottom thereof and upwardly through said body of exchange material therein, said exhaustant liquid exiting from said first pressure vessel at the top thereof;



d. passing said exhaustant liquid to the top of a second pressure vessel and downwardly through the body of exchange material therein, exiting at the bottom of said second vessel,

e. following the pattern so established for as many vessels as are connected in series;

f. thereafter passing a regenerant liquid in the aforesaid pattern counter current to the exhaustant liquid which regenerant liquid enters at the point where the exhaustant liquid exits and exits where the exhaustant liquid enters the system;

g. opening said valves in said central openings;

h. passing a back wash liquid into each of said vessels at the bottom thereof and upwardly through said body of exchange material therein, said back wash liquid exiting from each of said vessels at the top thereof;

i. passing said back wash liquid upwardly through said expansion chambers whereby causing said body of exchange material to expand into said expansion chamber;

j. passing said back wash liquid upward through said expansion chambers to said down take overflow where said back wash exits from said expansion chamber;

k. terminating the flow of said back wash liquid to permit said body of exchange material to settle back into said vessels; and

l. repeating steps (b) through (k).

4,001,114

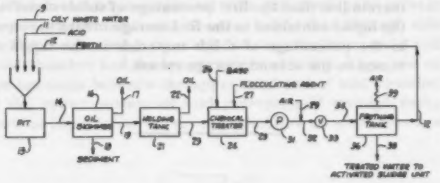
WASTE WATER TREATMENT PROCESS

Joel J. Joseph, Lakewood, Ohio, and John R. Keigher, Plainfield, Ill., assignors to SCM Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,829

Int. Cl.² B01D *17/02*

U.S. Cl. 210—44 **4 Claims**



1. In a process for treating waste water contaminated with fatty residue wherein said waste water is subjected to density separation for removing accumulated lighter oil phase from denser aqueous phase; and said denser aqueous phase is treated with flocculating agent and sufficient base for rendering pH of same at least about 6; and the resulting treated denser aqueous phase subjected to dissolved air flotation for recovery of stripped water product phase from formed oily froth; the improvement which comprises:

mildly acidulating with acid said waste water to pH of about 3–5.5 prior to said density separation step; and

permitting said oil froth collected from said dissolved air flotation step to flow by gravity into admixture with said waste water admitted to said process.

4,001,115

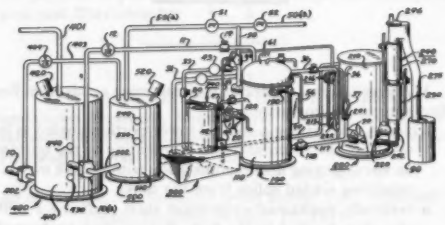
FILTRATION SYSTEM WITH STORAGE AND DILUTION RESERVOIRS

Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed June 21, 1974, Ser. No. 481,528

Int. Cl.² B01D *37/04*

U.S. Cl. 210—67 **8 Claims**



1. A method of liquid solid separation providing a controlled percentage of solids material contained in the unclarified liquid being separated comprising the steps of

discharging a contaminated liquid having a first percentage of solids materials therein into a first storage means for containing the liquid,

transferring a portion of the liquid from the first storage means into a second storage means controlling liquid having a second percentage of solids materials therein less than the percentage of solids material in the liquid contained in the first storage means at a transfer rate responsive to the differential between said first and said second percentage of solids material contained in the liquid,

transferring a quantity of the liquid from the second storage means into filtration means for clarifying the liquid by removing the solids materials therefrom at a predetermined transfer rate responsive to said second percentage

of solids material contained in the liquid transferred to the filtration means,

clarifying the liquid transferred into the filtration means by removing the solids materials and discharging the clarified liquid therefrom,

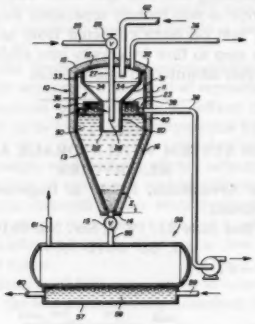
selectively transferring the clarified liquid discharged from the filtration means to the second storage means containing liquid having a second percentage of solids materials therein less than the first percentage of solids materials in the liquid contained in the first storage means in response to the percentage of solids materials in the liquid contained in the second storage means.

4,001,116

GRAVITATIONAL SEPARATION OF SOLIDS FROM LIQUEFIED NATURAL GAS

Yuksel Ali Selcukoglu, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Mar. 5, 1975, Ser. No. 555,354
Int. Cl.² F25J *3/00*
U.S. Cl. 210—83 **7 Claims**



1. A gravitational separator for separating solids from liquefied natural gas comprising:

a closed tank having a conical lower portion angled at least 60° from the horizontal and terminating at the bottom in an apex opening in communication with a valve means for removing settled solids from the tank,

a vertically positioned cylindrical shell, defining a stilling chamber, located in the tank at a position to depend at least partially below a predetermined level of liquefied gas which may be placed in the tank,

a conical shell vapor disengaging and expansion means located above the stilling chamber,

conduit means for feeding a gas or liquefied gas containing impurities into the tank and terminating in the stilling chamber at a location below the level of a liquefied gas in the tank,

means for withdrawing a gas or vapor from the vapor disengaging and expansion means,

means for withdrawing clean liquid from the tank, while maintaining said predetermined liquid level in the tank, without withdrawing a significant amount of solids settling downwardly in the tank,

means for discharging slurry directly from the tank into a vessel having external heating means to vaporize the slurry, and

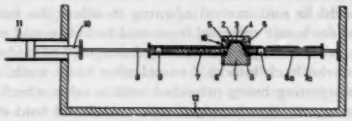
insulation on the outside of the tank.

4,001,117

SIEVE FILTRATION APPARATUS

Ulrich Trechsel, Bern, Switzerland, assignor to Pathophysiologisches Institut der Universitat Bern, Bern, Switzerland

Filed Sept. 11, 1975, Ser. No. 612,555
Claims priority, application Switzerland, Sept. 17, 1974, 12593/74
Int. Cl.² B01D *31/00*
U.S. Cl. 210—180 **9 Claims**



1. A sieve filtration apparatus comprising:

at least one filtering vessel having an inlet side and an outlet side and at least one sieving filter dividing said at least one vessel into a primary chamber on said inlet side and a secondary chamber on said outlet side,

two coaxial cylinders disposed on opposite sides of said at least one vessel, projecting outwardly therefrom, and communicating with said primary chamber, said vessel and said cylinders forming an integral unit,

at least two pistons, each having a piston-rod and cooperating with a respective one of said cylinders, at least one of said pistons being movable for producing and stabilizing a predetermined pressure in said vessel-cylinder unit, and

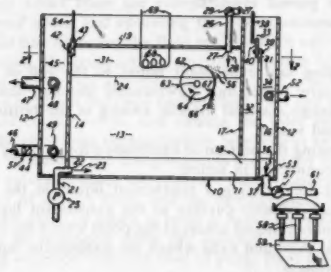
means for producing a relative reciprocating movement between said vessel-cylinder unit and said pistons parallel to the axis of said cylinders.

4,001,118

APPARATUS FOR SEPARATING FOREIGN SOLID PARTICLES FROM A LIQUID

Siegmund J. Enzmann, 4534 Leslie Ann Lane, Racine, Wis. 53403

Filed Aug. 11, 1975, Ser. No. 603,634
Int. Cl.² B01D *35/18, 21/26, 29/00*
U.S. Cl. 210—187 **16 Claims**



1. Apparatus for separating foreign solid particles from a liquid comprising a tank having a bottom and side walls for receiving liquid, said tank having a liquid inlet and a liquid outlet for a light-weight liquid and spaced apart from each other to be respectively adjacent said side walls and disposed above the elevation of said bottom for the flow of the light-weight liquid into and out of said tank, said tank having a liquid inlet for a heavy liquid and disposed adjacent said bottom for introducing the heavy liquid into said tank and presenting the heavy liquid in a layer underneath the light-weight liquid and providing a vehicle for moving the foreign solid particles which sink from the light-weight liquid, and said tank having a liquid conduit with a liquid entrance-way disposed adjacent said bottom and a liquid exit-way disposed at an

elevation above that of said liquid entrance-way, said liquid entrance-way and said liquid inlet for said heavy liquid being spaced apart with respective ones thereof adjacent opposite ones of said side walls for the flow of the particle-laden heavy liquid out of said tank, a liquid-flow connector connected with said tank in liquid-flow communication with said liquid conduit exit-way for receiving the heavy fluid therefrom, and a hydro-cyclotron connected with said connector in liquid-flow communication with said liquid conduit for receiving the particle-laden heavy liquid and separating the particles therefrom.

4,001,119

THICKENING APPARATUS

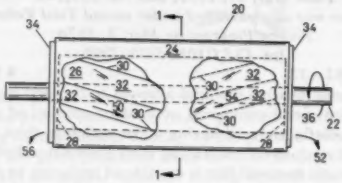
A. Bruce Hunter, 18 W. Park Blvd., Dollard des Ormeaux, Quebec, Canada

Filed Jan. 31, 1975, Ser. No. 545,767

Claims priority, application United Kingdom, Feb. 4, 1974, 04942/74

Int. Cl.² B01D *33/06*

U.S. Cl. 210—402 **1 Claim**



1. A filtering device for separating solid particles from liquid in a slurry of said particles and liquid when substantially immersed in said slurry comprising in combination; axially horizontal and rotatable cylinder-filter means embodying essentially in co-axial relationship therewith, a plurality of longitudinally extending and helicoidally parallel compartments extending from end to end circumferentially contiguous to the inner surface of said cylinder-filter means, those of said compartments upon one side of the vertical axial plane of said cylinder-filter means conveying rich filtrate by gravity to one end of said cylinder-filter means, those compartments upon the other side of said vertical axial plane conveying lean filtrate by gravity to the opposite end of said cylinder-filter means; said cylinder-filter means including in co-axial relationship, an outer cylindrical filter and an inner cylindrical shell, said compartments being circumferentially bounded by said filter and shell and generally radially bounded by elongated generally helicoidal partitions extending between said filter and said shell, and including semi-partition in substantially all of said helicoidal compartments to separate one end of such compartments into inner and outer sub-compartments wherein said inner sub-compartments are closer to the axis of said cylinder-filter means and said outer sub-compartments are more distant therefrom whereby filtrate trapped in said inner sub-compartments will be conveyed to said one end irrespective of the rotational position of said cylinder-filter means.

4,001,120

WATER FILTER DEVICE

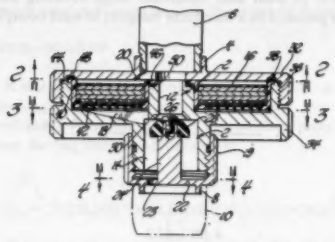
Charles Gelman, and Attila Vadnay, both of Ann Arbor, Mich., assignors to Gelman Instrument Company, Ann Arbor, Mich.

Continuation of Ser. No. 516,322, Oct. 21, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,796

Int. Cl.² B01D *27/10*

U.S. Cl. 210—420 **2 Claims**

1. A water filtering device for attachment to a faucet comprising: a passage having an upper portion with an inlet for water from the faucet and having a lower portion with a water outlet at the lower end thereof, a flat annular water filtering chamber surrounding the upper portion of said passage, said water filtering chamber having upper and lower axial portions removably secured together whereby said chamber is adapted to removably receive in fixed position therein a replaceable flat annular water filtering cartridge, sealing means in said chamber for sealing engagement with said cartridge to prevent flow of water through said chamber other than through said cartridge, one or more openings between the lower axial end of said chamber and the lower portion of said passage, one or more openings between the upper axial end of said chamber and the upper portion of said passage, said passage being otherwise imperforate to prevent radial flow of water between



said passage and said filtering chamber intermediate the axial ends of said filtering chamber, a sleeve rotatably secured to the lower portion of said passage for movement between selected axial positions relative to said passage, and a valve mounted in said sleeve and projecting into the lower portion of said passage, said valve being movable axially thereof by rotation of said sleeve between a first position in which it blocks the flow of water directly from the upper portion of said passage to the lower portion of said passage whereby water from the faucet is caused to flow from said passage into and then axially through said filtering chamber and then back into said passage and out of said water outlet, and a second position in which said passage is open between said upper and lower portions to permit flow directly through said passage to bypass said filter chamber.

4,001,121

CENTRIFUGAL TREATMENT OF FLUIDS

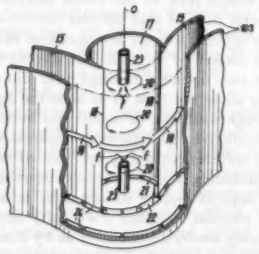
Ernst-August Bielefeldt, Neumunster, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH - Division Hamburger Flugzeugbau, Hamburg, Germany

Filed Feb. 8, 1973, Ser. No. 330,719

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B01D *21/26*

U.S. Cl. 210—512 R **12 Claims**



1. An apparatus for centrifugally treating a fluid, comprising

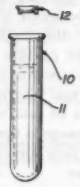
conduit means forming a curved channel of substantially rectangular cross-section connected to a source of fluid to be treated for traversal by said fluid at high speed, said conduit means being provided at a concave side of said channel with at least one transverse recess extending across the full width of said channel, said recess being partly separated from said channel by a transverse upstream edge overhanging said recess and by a transverse downstream edge confronting the oncoming fluid stream, and extraction means opening into said recess adjacent a centerline thereof for axially removing a portion of a body of fluid circulating in said recess, the cross-section of said channel being larger at said upstream edge than at said downstream edge, said recess having a generally part-cylindrical periphery extending over an arc of at least 180°, said channel being fully open toward said recess over a complementary arc lying between said upstream and downstream edges, at least said upstream edge forming an acute vertex angle pointed in a direction tangent to said complementary arc.

4,001,122

METHOD AND DEVICE FOR SEPARATING BLOOD COMPONENTS

Richard J. Griffin, Denver, Colo., assignor to Telan Corporation, Denver, Colo.

Filed Aug. 22, 1973, Ser. No. 390,354
Int. Cl.² B01D *21/26*
U.S. Cl. 210—516 **9 Claims**



1. A barrier device for separating the sera, fibrin and heavier phases with the latter phase including red cells, white cells and platelet elements and wherein the phases have differing specific gravities from a blood sample within a tube or tubular holder, said barrier device comprising a circular member having an outer diameter less than the inner diameter of said tube with the diametric difference therebetween allowing gravity motivated movement of said barrier device coaxially in said tube with fluidic flow of the blood sample components past the peripheral edge of said circular member, said barrier device having a specific gravity intermediate that of the sera and the heavier phases of the blood sample to be separated, having at least one opening through said circular member large enough to allow the flow of at least the lighter components therethrough when the tube and said member are in an environment conducive to component separation based upon specific gravity differences along the axis of said tube, and having means including a series of projections spaced around the peripheral edge extending substantially in an axial direction from said circular member , whereby application of a migration inducing environment such as by centrifugal force to said tube will cause said member to migrate along the length of said tube while passing through the blood sample phases until it occupies a position intermediate the sera and the other blood sample phases.

4,001,123

FABRIC SOFTENER COMPOSITIONS CONTAINING N-ALKYL-1,3-PROPYLENE DIAMINE TREATED WITH MALEIC ANHYDRIDE

Adolph Renold, Dornach, Switzerland, assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 287,834, Sept. 11, 1972, Pat. No. 3,891,563. This application Apr. 18, 1975, Ser. No. 569,162
Int. Cl.² D06M *13/34*
U.S. Cl. 252—8.8 **6 Claims**

1. A fabric softener composition comprising an N-higher alkyl-1,3-propylene diamine, said higher alkyl group having from 12 to 22 carbon atoms, said N-higher alkyl-1,3-propylene diamine having been contacted with maleic anhydride, and an additive, said additive selected from the group consisting of urea, sugar, and mixtures thereof.

4,001,124

LONG-WEARING PLASTIC BEARINGS

Eugene H. Hussey, Temple, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Mar. 17, 1975, Ser. No. 559,142
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976
Int. Cl.² C10M *5/00, 7/00*
U.S. Cl. 252—12 **4 Claims**

1. A plastic bearing material adapted to be used in sliding contact with metal comprised of a minor amount of a polymeric polyolefin material having a low exchange time, minor amount of a relatively chemically inert fluorinated hydrocarbon polymeric material that is capable of replacing or supplementing the low exchange time material at the metal surface, and a comparatively tough, rigid material selected from the group consisting of nylon, polyesters, polycarbonates, polyacetals, and polysulfones that will act as a carrier and retainer for the polymeric material having the relatively high chemical inertness.

4,001,125

LUBRICANT FOR MANDRELS, FORGING DIES, MOLDS AND THE LIKE

Archibald R. Newton, III, Emlenton, Pa., assignor to Grafo Colloids Corporation, Sharon, Pa.

Filed June 9, 1975, Ser. No. 584,722
Int. Cl.² C10M *1/10*
U.S. Cl. 252—29 **13 Claims**

1. In a lubricant composition for high temperature use with mandrels, forging dies and molds comprising a dispersion of a solid lubricant powder, water, a thickener and a dispersant; the improvement wherein said solid lubricant powder comprises gilsonite.

4,001,126

HEAT PROTECTIVE MATERIAL AND METHOD OF MAKING THE MATERIAL

Frank A. Marion, and Hugh J. McSpadden, both of Riverside, Calif., assignors to Universal Propulsion Co., Riverside, Calif.

Continuation of Ser. No. 253,971, May 17, 1972, abandoned, which is a continuation of Ser. No. 4,157, Jan. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 766,066, Nov. 15, 1968, abandoned. This application Jan. 21, 1974, Ser. No. 434,960
Int. Cl.² C04B *43/00*
U.S. Cl. 252—62 **4 Claims**

1. A method of producing a thermally protective material capable of providing heat insulation by withstanding elevated temperatures in the thousands of degrees for extended periods of time in the tens of hours without gross destruction including:

mixing an epoxide and a filler material to form a first mixture, the filler material having properties of being chemi-

cally non-reactive at normally encountered ambient temperatures and having properties of chemically reacting in successive steps at progressive increments of temperature above the normally ambient temperature to provide a plurality of chemical products each resulting from an endothermal chemical reaction of previous chemical products where each successive endothermic chemical reaction in the chain occurs at an elevated temperature of small increment relative to the previous endothermic chemical reaction in the chain,

mixing a polysulfide and the filler materials and a curative for the epoxide to form a second mixture, and

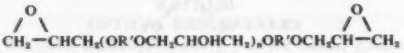
mixing the first and second mixtures to produce the thermally protective material,

the epoxide having a range of 4 parts by weight to 1 part by weight of epoxide to 1 part to 4 parts by weight of polysul-

fide, the thermally protective material being initially non-porous and the thermally protective material providing transpirational cooling by the passage through a char of the gases produced from the filler materials, the thermally protective material having elastomeric properties to inhibit cracking of the thermally protective material during the formation of the char as a result of the subjection of the thermally protective material to the elevated temperatures, the binder being selected from a selected group consisting of mercapto-terminated polymers having the general formula

$$HS(R{-}SS)_nRSH$$

where R is a polyvalent organic radical containing at least one methylene group and n is an integer of from about 3 to 100, and preferably from about 3 to 25 and the epoxy-terminated polymers having the general formula



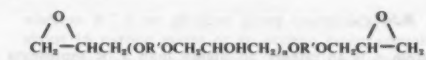
where R′ is the divalent organic radical of a dihydric alcohol or a dihydric phenol and n usually has a value of less than 1 to a value of about 20, the material selected for crosslinking the mercapto-terminated polymers and the epoxide-terminated polymers having a percentage by weight of approximately 15 parts to 100 parts by weight of epoxide-terminated polymers, the filler materials including phosphates and borates, the phosphates being selected from a group consisting of sodium and ammonium phosphate and the borates being selected from a group consisting of sodium and ammonium borate, the filler materials being uniformly dispersed in the binder in about 10 to 80 parts by weight of at least one of sodium or ammonium phosphate per 100 parts by weight of binder and from about 25 to 80 parts by weight of at least one of sodium or ammonium borate per 100 parts by weight of the binder.

2. A thermally protective material capable of providing heat insulation by withstanding elevated temperatures as high as thousands of degrees Fahrenheit for extended periods of time as long as tens of hours without gross destruction, consisting essentially of:

a binder having properties of forming a char when subjected to heat, and at least one filler material mixed with the binder and having properties of chemically reacting in successive steps to provide in sequence a plurality of chemical products each resulting from an endothermal chemical reaction of previous chemical products where each successive endothermic chemical reaction in the chain occurs at an elevated temperature of small increment relative to the previous endothermic chemical reaction in the chain, the filler material has properties of obtaining the production in the successive chemical reactions of gases which travel through the char to the surface of the thermally protective material to cooperate with the char in providing a surface reflective to the heat and wherein the filler materials have properties of obtaining the production in the successive chemical reactions of chemical products which decompose on an endothermal basis, the binder being selected from a group consisting of mercapto-terminated polymers and epoxy-terminated polymers, the mercapto-terminated polymers and epoxy-terminated polymers being cross-linked, the mercapto-terminated polymers having the general formula

$$HS(R{-}SS)_nRSH$$

where R is a polyvalent organic radical containing at least one methylene group and n is an integer of from about 3 to 100, and preferably from about 3 to 25 and the epoxy-terminated polymers having the general formula



where R′ is the divalent organic radical of a dihydric alcohol or a dihydric phenol and n usually has a value of less than 1 to a value of about 20,

a material selected from a group consisting of the aliphatic and aromatic primary, secondary and tertiary amines and having properties of serving as an agent for cross-linking the mercapto-terminated polymers and the epoxide-terminated polymers, the material selected for cross-linking the mercapto-terminated polymers and the epoxide-terminated polymers having a percentage by weight of approximately 15 parts to 100 parts by weight of the epoxide-terminated polymers, the filler materials being selected from a group consisting of phosphates and borates, the phosphates being selected from a group consisting of sodium and ammonium phosphate and the borates being selected from a group consisting of sodium and ammonium borate, the filler materials being uniformly dispersed in the binder in about 10 to 80 parts by weight of at least one of sodium or ammonium phosphate per 100 parts by weight of binder and from about 25 to 80 parts by weight of at least one of sodium or ammonium borate per 100 parts by weight of the binder.

4,001,127

PROCESS OF PREPARING SINGLE CRYSTALS OF STRONTIUM BARIUM NIOBATE

Kouiti Megumi; Kazuyuki Nagatsuma; Yasutoshi Kashiwada, and Yoshio Furuhata, all of Kokubunji, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,677

Claims priority, application Japan, July 25, 1973, 48-83043

Int. Cl.² B01J 17/18

U.S. Cl. 252—62.9 **4 Claims**

1. In a process of preparing single crystals of strontium barium niobate of the type wherein a melt of a mixture of strontium oxide, barium oxide and niobium pentoxide is prepared, said melt having a temperature variation of less than 1° C and a single crystal of strontium barium niobate is grown from said melt by the Czochralski method, wherein a seed crystal is immersed in said melt and pulled therefrom at a speed of 2mm/hour, the improvement wherein the compositions, included in region B shown in FIG. 3 of the accompanying drawings are used as the ternary compositions of strontium oxide, barium oxide and niobium pentoxide in said melt, said

single crystals having a composition included in region B' shown in FIG. 4 and a local gradient of birefringence of smaller than 1×10^{-4}/cm.

4,001,128

HIGH VOLTAGE INSULATING MATERIALS

Richard John Penneck, Lechlade, England, assignor to Raychem Corporation, Menlo Park, Calif.

Filed July 21, 1972, Ser. No. 274,110

Int. Cl.² H01B 3/00

U.S. Cl. 252—63.2 **10 Claims**

1. Blended anti-tracking insulating material suitable for high voltage applications consisting essentially of an organic synthetic polymeric materials and an anti-tracking filler system wherein the polymeric material is at least 10% by weight of the insulating material, and the anti-tracking filler system comprises at least 20% by weight of alumina trihydrate based on the weight of the polymer and filler system and at least 1% by weight of an organic silicon-containing compound containing the Si—O—Si group which has been coated prior to blending of said material and system with at least one organosilicon compound, based on the weight of the polymer and filler system, wherein said organosilicon compound is a silane of the formula:

$$R_nSiX_{4-n}$$

wherein n is an integer no higher than 3, R represents an organic radical bonded to the silicon atom by a Si—C bond and X is selected from the group consisting of chlorine or a radical bonded to silicon by an oxygen atom.

2. Blended anti-tracking insulating materials suitable for high voltage applications consisting essentially of at least 10% by weight of an organic synthetic polymer selected from the group consisting of polyolefins, polyacrylates, silicon polymers, polyepoxides, butyl rubbers, ionomeric polymers, polyvinul acetate and copolymers or terpolymers thereof having a residual char after pyrolysis of less than 10%, at least 20% by weight of alumina trihydrate and at least 1% by weight of an inorganic silicon-containing compound selected from the group consisting of silica or metal silicate which has been coated prior to blending of said polymer, alumina trihydrate and filler with a silane of the formula:

$$R_nSiX_{4-n}$$

wherein n is an integer no higher than 3, R is an organic group bonded by a Si—C bond and X is a radical selected from the group consisting of chlorine or a radical bonded to silicon by an oxygen atom.

4,001,129

FIRE RESISTANT FUNCTIONAL FLUIDS

Martin B. Sheratte, Canoga Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

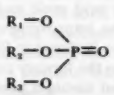
Continuation-in-part of Ser. Nos. 230,131, Feb. 28, 1972, abandoned, and Ser. No. 449,623, March 11, 1974, Pat. No. 3,935,116. This application Nov. 1, 1974, Ser. No. 520,052

The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

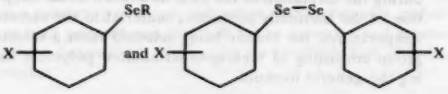
Int. Cl.² C10M 3/40, 3/32

U.S. Cl. 252—78.5 **24 Claims**

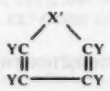
1. A functional fluid composition consisting essentially of (1) a phosphorus compound selected from the group consisting of phosphate esters and mixtures of said phosphate esters, said phosphate esters having the general formula:



where R_1 and R_2 are each a member selected from the group consisting of alkyl of from about 3 to about 10 carbon atoms, and alkoxyalkyl having from about 3 to about 8 carbon atoms, and R_3 is a member selected from the group consisting of alkyl and alkoxyalkyl, as above defined, aryl and alkaryl, containing from 6 to about 8 carbon atoms, (2) a polyalkylene glycol material, said glycol material selected from the group consisting of a polypropylene glycol mono- or diether, and a mono- or diether of an ethylene-propylene copolymer, said mono- or diether having at least one terminal oxyalkyl group wherein the alkyl radicals contain from 1 to about 4 carbon atoms, and mixtures thereof, said polyalkylene glycol material having a molecular weight ranging from about 500 to about 2,000, (3) a dicarboxylic acid ester selected from the group consisting of the alkyl diesters of adipic and sebacic acid, containing alkyl groups of from about 4 to about 12 carbon atoms, and an alkyl diester of phthalic acid containing alkyl groups of from about 4 to about 12 carbon atoms, said phosphorus compound being present in an amount ranging from about 14 to about 89%, and said glycol material being present in an amount ranging from about 9 to about 84%, by weight of said composition, said dicarboxylic acid ester being present in an amount ranging from about 5% up to about 200%, by weight of said glycol material or of said mixtures thereof, said phosphorus compound, said glycol material and said dicarboxylic acid ester being present in amounts such that said composition has a viscosity at −65° F of not greater than about 6,000 centistokes, and a viscosity at 210° F of not less than 2.25 centistokes, and (4) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:



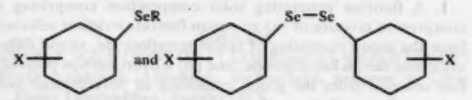
where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



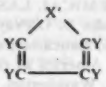
where X' is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

3. A functional fluid composition consisting essentially of (1) a combination of at least two phosphate esters, one of said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures thereof, and a second of said phosphate esters containing at least two aromatic groups selected from the class consisting of aryl and alkaryl groups, and mixtures thereof, (2) a combination of at least two polyalkylene glycol ethers containing terminal oxyalkyl groups wherein the alkyl radicals contain from 1 to about 8 carbon atoms, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, one of said polyalkylene glycol ethers having a molecular weight ranging from about 500 to about 2,000, and a second of said polyalkylene glycol ethers having a molecular weight ranging from about 2,000 up to about 25,000, (3) a dicarboxylic acid ester selected from the group consisting of the aliphatic and aromatic dicarboxylic acid diesters, and mixtures thereof, said dicarboxylic acid ester containing alkyl groups of from about 4 to about 12 carbon atoms, said dicarboxylic acid ester being present in an amount ranging from

about 5 up to about 200% by weight of said combination of glycol ethers, said phosphate esters, said polyalkylene glycol ethers and said dicarboxylic acid ester being present in amounts such that said composition has a viscosity at −65° F of not greater than about 6,000 centistokes, and a viscosity at 210° F of not less than 2.25 centistokes, and (4) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:



where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



where X' is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

14. A functional fluid composition as defined in claim 3, including a small amount of a tertiary organic phosphine having the formula:

where R_a, R_b and R_c are each a member selected from the group consisting of aryl and alkaryl.

4,001,130

OPTICAL BRIGHTENERS

Erich Schinzel, Hofheim, Taunus; Wilfried Sahm, Kelkheim, Taunus, and Günter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 7, 1974, Ser. No. 431,045

Claims priority, application Germany, Jan. 12, 1973, 2301438

Int. Cl.² C11D *3/42*

U.S. Cl. 252—89 B **8 Claims**

1. A detergent composition consisting essentially of as optical brightener 0.01 to 2% by weight of a compound of the formula (1)

$$A - CH = CH - CH = CH - B \qquad (1)$$

in which A is phenyl, naphthyl or 2-thienyl and B is 2-benzoxazolyl or defined as A, which radicals A and B are unsubstituted or substituted by lower alkyl; lower alkoxy; phenyl; lower alkyl substituted by phenyl; chlorine; cyano; lower alkanoylamino; benzoylamino; carboxy or sulfo or a group of the formula

$$-COOR,\ -CONR^1R^2,\ -SO_2OR,\ -SO_2NR^1R^2,\ -COR^3 \text{ or } SO_2R^4$$

in which R is lower alkyl or phenyl, which radicals R are unsubstituted or substituted by hydroxy, lower alkoxy, lower dialkylamino or lower trialkylammonium; R^1 and R^2 are hydrogen or lower alkyl or R^1 and R^2 together with the nitrogen are piperidino or morpholino; R^3 is lower alkyl or phenyl and R^4 is lower alkyl or phenyl which racicals R^4 are unsubstituted or substituted by lower dialkylamino, lower trialkylammonium, lower alkanoylamino or sulfo.

4,001,131

ACTIVATION OF ORGANIC PERACIDS BY DI-KETONES

Ronald Earl Montgomery, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

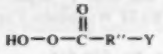
Filed June 3, 1975, Ser. No. 583,383

Int. Cl.² C11D *7/56*

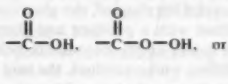
U.S. Cl. 252—99 **14 Claims**

1. A bleaching and dye transfer inhibition composition, consisting essentially of:

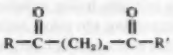
a. from about 1% to 75% by weight of a water-soluble organic peroxyacid or salt thereof bleaching agent of the formula



wherein R'' is an alkylene group containing from 1 to about 16 carbon atoms or an arylene group containing from 6 to about 8 carbon atoms and Y is hydrogen, halogen, alkyl, aryl,



b. from about 0.1% to 50% by weight of a water-soluble di-ketone activator of the formula



wherein *n* is 0 or 1 and R and R' are alkyl and substituted alkyl moieties having from 1 to 20 carbon atoms; aryl and substituted aryl moieties; heterocyclic moieties; or moieties wherein R and R' are joined in a ring structure having 5 to 12 carbon atoms; and

c. from about 1% to 85% by weight of a buffering agent to maintain the in-use pH of the composition within the range of from 6 to 10.

4,001,132

AUTOMATIC DISHWASHING DETERGENT COMPOSITION

Edward John Maguire, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 17, 1974, Ser. No. 479,969

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C11D *7/54, 7/56*

U.S. Cl. 252—105 **15 Claims**

1. A granular cleaning composition, particularly suitable for use in automatic dishwashers, having improved cleaning and anti-redeposition properties, consisting essentially of:

a. from about 4% to about 20% by weight of an alkoxylated nonionic surface-active agent, wherein said alkoxy moiety is selected from the group consisting of ethylene oxide, propylene oxide and mixtures thereof;

b. from about 5% to about 20% by weight of a sulfonated aromatic compatibilizing agent having a critical micelle concentration greater than about 1% by weight at 25°C,

wherein the weight ratio of said alkoxylated nonionic surface-active agent to said sulfonated compatibilizing agent is in the range from about 2:5 to about 5:3;

c. from about 15% to about 60% by weight of a mixture of (1) a water-soluble alkali metal sulfite, ammonium sulfite, substituted ammonium sulfite or mixtures thereof and (2) a water-soluble alkali metal sulfate, ammonium sulfate, substituted ammonium sulfate or mixtures thereof, said components being present in a weight ratio of sulfite to sulfate from about 1:4 to about 2:1;

d. which is substantially free of a chlorine bleach component.

4,001,133

METHOD OF WASHING GLASSWARE AND INHIBITED CLEANING SOLUTION AND ADDITIVE COMPOSITION USEFUL THEREIN

Malachi E. Sorgenfrei, Grosse Ile, and Otto T. Aepli, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 4, 1974, Ser. No. 520,546

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C11D *7/06, 3/30*

U.S. Cl. 252—156 **9 Claims**

1. In a method of recycling returnable hot end coated glass containers wherein the glass containers are cycled a plurality of cycles over the normal useful life thereof, the glass containers in said cycles being filled with a product and thereafter emptied and the resultant soiled empty containers being returned for washing and refilling with a product, the said soiled returned glass containers being washed in said cycles in an alkaline aqueous solution of alkali metal hydroxide prior to refilling, the said hot end coated glass containers having a thin protective coating thereon including a coating of an organic hot end coating material applied to the glass containers while hot, the resultant hot end coating initially being substantially free of objectionable color and imparting abrasion resistance to the glass containers, the initial hot end coating being altered by the repeated washings in said cycles in the said aqueous solution of alkali metal hydroxide whereby the glass containers exhibit loss of abrasion resistance or an objectionable discoloration appears, the improvement in combination therewith which consists essentially of prolonging the useful life of the said protective hot end coating including the said coating of the organic hot end coating material by washing the said soiled hot end coated glass containers in an inhibited aqueous caustic soda cleaning solution consisting essentially of on a weight basis from 0.3 to 6.0 percent of caustic soda, from 0.01 to 0.3 percent of a soluble zinc containing compound when calculated as zinc oxide, and the remainder water.

4,001,134

SCALE INHIBITING PROCESS

Sheldon Boris Markofsky, Olney, and Jacob Block, Rockville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,274

Int. Cl.² C02B *5/06*

U.S. Cl. 252—180 **3 Claims**

1. A process for inhibiting the deposition of scale onto the heat exchange surfaces of evaporators which consists essentially of adding a copolymer of maleic anhydride or maleic acid and allylacetate, the copolymer containing from 10 to 90% maleic anhydride or maleic acid and having a molecular weight of 500 to 10,000; so as to provide a concentration of 0.1 to 100 parts per million.

4,001,135

FLUORINE GENERATING SOLID FORMULATION FOR USE IN CHEMICAL LASERS

John E. O'Pray; Ronald E. Channell, both of Edwards, and Francisco Q. Roberto, Lancaster, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 537,492, Dec. 30, 1974, abandoned. This application July 1, 1975, Ser. No. 592,296

Int. Cl.² C06D *5/06*

U.S. Cl. 252—187 R **4 Claims**

1. A fluorine generating solid composition comprising a compressed mixture of (a) an xenon fluoride oxidizer selected from the group consisting of xenon tetrafluoride, xenon difluoride and xenon hexafluoride; and (b) a hydrocarbon polymer fuel selected from the group consisting of polyethylene and polytetrafluoroethylene wherein said xenon fluoride oxidyzer is present in a ratio of about 1 to 7 moles of oxidizer to about 1 mole of said fuel.

4,001,136

FLUORINE GENERATING FORMULATION FOR USE IN CHEMICAL LASERS

Ronald E. Channell; John E. O'Pray, both of Edwards, and Francisco Q. Roberto, Lancaster, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 537,491, Dec. 30, 1974, abandoned. This application July 1, 1975, Ser. No. 592,298

Int. Cl.² C06D *5/06*

U.S. Cl. 252—187 R **3 Claims**

1. A solid gas generating composition comprising a compressed mixture of (a) about 53 to 92 weight percent of a perfluoroammonium salt of a fluorinated Lewis acid selected from the group consisting of perfluoroammonium tetrafluoroborate, perfluoroammonium hexa fluoroarsenate, and perfluoroammonium hexafluoroantimonate; (b) about 0.5 to 2 weight percent of a metal nitride selected from the group consisting of aluminum nitride, magnesium nitride, and lithium nitride; and (c) about 7 to 46 weight percent of an alkali metal fluoride selected from the group consisting of lithium fluoride, sodium fluoride, potassium fluoride, rubidium fluoride, and cesium fluoride.

4,001,137

NEMATIC COMPOUNDS AND MIXTURES

Ralf Steinstrasser, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

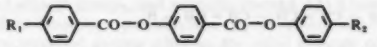
Division of Ser. No. 277,502, Aug. 3, 1972. This application June 24, 1975, Ser. No. 589,916

Claims priority, application Germany, Aug. 7, 1971, 2139628

Int. Cl.² G02F *1/13;* **C09K** *3/34*

U.S. Cl. 252—299 **8 Claims**

1. A nematic mixture of liquid crystalline compounds, at least one of which is (a) a compound of the formula:



wherein R_1 is straight-chain alkyl or straight-chain alkoxy of 1–7 carbon atoms or straight-chain alkanoyloxy of 2–7 carbon atoms and R_2 is straight-chain alkyl or straight-chain alkoxy of 1–7 carbon atoms, or (b) a member of the group consisting of 4′-pentoxyphenyl ester of 4-propylbenzoic acid, 4′-hexoxyphenyl and 4′-heptoxyphenyl esters of 4-butylbenzoic acid, 4′-pentoxyphenyl ester of 4-pentylbenzoic acid, 4′-butoxyphenyl, 4′-pentoxyphenyl, 4′-hexoxyphenyl and 4′-heptoxyphenyl esters of 4-hexylbenzoic acid, 4′-pentylphenyl ester of anisic acid, 4′-butylphenyl and 4′-pentylphenyl esters of 4-

pentoxybenzoic acid, and 4'-propylphenyl, 4'-butylphenyl, 4'-pentylphenyl and 4'-hexylphenyl esters of 4-hexoxybenzoic acid.

4,001,138

STABLE SOLUTIONS OF FLUORESCENT BRIGHTENERS

Frank Lohmann, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,297

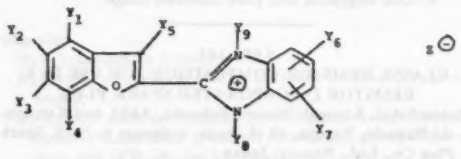
Claims priority, application Switzerland, Dec. 19, 1973, 17811/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C09K *11/00*; C07D *231/54*; D06L *3/12*

U.S. Cl. 252—27 11 Claims

1. A stable acid or neutral solution of quaternised fluorescent brighteners consisting essentially of a quaternised fluorescent brightener of the formula



wherein Y_1 represents hydrogen, methyl, ethyl, methoxy, halogen or together with Y_2 represents a fused benzene ring, Y_2 represents hydrogen, methyl, ethyl, methoxy, halogen or together with Y_1 or Y_3 represents a fused benzene ring, Y_3 represents hydrogen, methyl, ethyl, alkoxy with 1 to 4 carbon atoms, halogen or together with Y_2 or Y_4 represents a fused benzene ring, Y_4 represents hydrogen, alkyl with 1 to 4 carbon atoms, methoxy, halogen or together with Y_3 represents a fused benzene ring, Y_5 represents hydrogen, alkyl with 1 to 4 carbon atoms or phenyl which is unsubstituted or substituted by at least one of methyl or methoxy, Y_6 represents hydrogen, alkyl with 1 to 4 carbon atoms, alkylsulphonyl with 1 to 4 carbon atoms, methoxy or halogen, Y_7 represents hydrogen, methyl, methoxy or halogen, Y_8 represents alkyl with 1 to 4 carbon atoms, hydroxyalkyl with 2 to 4 carbon atoms, cyanoethyl, phenyl, cyclohexyl or benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy, Y_9 represents alkyl with 1 to 4 carbon atoms which is unsubstituted or substituted by hydroxy or alkoxy with 1 to 4 carbon atoms, benzyl which is unsubstituted or substituted by chlorine or methoxy or represents a radical $-CH_2CN$, $-CH_2CONH_2$ or $-CH_2COOR$, wherein R represents an alkyl group with 1 to 4 carbon atoms, and Z represents halogen, an alkylsulphate with 1 to 4 carbon atoms or a phenylsulphonyl radical which is unsubstituted or substituted by methyl and, in the case of the weakly acid solution, a polar organic compound, water and a weak acid, and, in the case of the neutral solution, a polar, aprotic organic compound and water.

4,001,139

LIQUID SCINTILLATION SOLUTION

Edward C. Long, Huntington Beach, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 541,243, Jan. 15, 1975, abandoned. This application Nov. 28, 1975, Ser. No. 636,383

Int. Cl.² C09K *11/06*; G01T *1/204*

U.S. Cl. 252—301.17 8 Claims

1. A liquid scintillation solution comprising a mixture of (a) a liquid scintillation solvent, (b) a primary scintillation solute, (c) a secondary scintillation solute, (d) a plurality of substantially different surfactants, (e) a dissolving-transparentizing agent.

2. The liquid scintillation solution of claim 1 wherein the dissolving-transparentizing agent is a cyclic ether.

5. The liquid scintillation solution of claim 2 wherein the secondary scintillation solute is Dimethyl POPOP.

8. The liquid scintillation solution of claim 2 wherein the scintillation solvent is toluene, the primary scintillation solute is PPO, the secondary scintillation solute is Dimethyl POPOP, the plurality of substantially different surfactants are isooctylphenolpolyethoxyethanol and sodium dihexyl sulfosuccinate and the dissolving and/or transparentizing agent is tetrahydrofuran.

4,001,140

CAPSULE MANUFACTURE

Peter L. Foris; Robert W. Brown, and Paul S. Phillips, Jr., all of Appleton, Wis., assignors to NCR Corporation, Dayton, Ohio

Filed July 10, 1974, Ser. No. 487,322

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 8 Claims

1. A process for manufacturing minute capsules, en masse, in an aqueous manufacturing vehicle, comprising the steps of:

a. establishing an agitating single-phase aqueous solution system including urea and a system modifier material present as 0.75 to 10 percent, by weight, of the aqueous manufacturing vehicle, selected from the group consisting of poly(ethylene-co-maleic anhydride), poly(methylvinylether-co-maleic anhydride), and poly(acrylic acid),

b. dispersing into the solution system particles of an intended capsules core material substantially insoluble in the system

c. adding formaldehyde to the system

d. continuing agitation of the system to yield a polymerization reaction between the urea and the formaldehyde resulting in

i. liquid-liquid phase separation of the urea/formaldehyde polymerization product above a molecular weight to be soluble in the system and

ii. continued reaction of the separation liquid polymerization product to solid capsule wall material individually surrounding particles of the dispersed intended capsule core.

4,001,141

COSMETIC EMULSIFIERS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Montjay-la-Tour, both of France, assignors to Societe Anonyme dit: L'Oreal, Paris, France

Division of Ser. No. 480,671, June 17, 1974, Pat. No. 3,914,407, which is a division of Ser. No. 119,363, Feb. 26, 1971, Pat. No. 3,824,294, which is a continuation-in-part of Ser. No. 780,299, Nov. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 677,047, Oct. 23, 1967, Pat. No. 3,595,924. This application June 6, 1975, Ser. No. 584,499

Claims priority, application Luxembourg, Oct. 21, 1966, 52227; Oct. 24, 1966, 52228; Oct. 6, 1967, 54622; France, Dec. 1, 1967, 67.130712

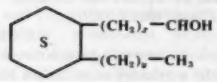
Int. Cl.² B01F *17/42*

U.S. Cl. 252—351 1 Claim

1. A composition consisting essentially of a mixture of different compounds, each having the formula

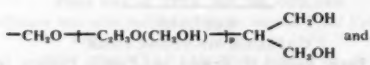
$RO(C_2H_3O(R'))_m(C_2H_3O(X))_nH$

wherein R is a lipophilic hydrocarbon residue of a member selected from the group consisting of hydrogenated lanolin,

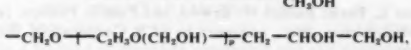


wherein $x + y = 10$ and

wherein $+ y = 12$, R' is selected from the group consisting of methyl and ethyl, X is selected from the group consising of $-CH_2OH$,



and



m has a statistical average value between 1–10 inclusive, *n* has a statistical average value between 1–5 inclusive, *p* is an integer between 0–10 inclusive and the product $n(p+2)$ lies between 2–12 inclusive, said mixture being present in surface-active amounts in said composition.

4,001,142

BLOOD GAS CONTROL

James E. Turner, Madison, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed July 25, 1975, Ser. No. 599,291

Int. Cl.² G01N *31/00, 33/16*

U.S. Cl. 252—408 **16 Claims**

1. A liquid composition of matter for use as a blood gas control which comprises water, a dye, a buffering agent, a lower alkyl acid, a source of bicarbonate ion and an amount of dissolved oxygen, carbon dioxide and nitrogen gas.

4,001,143

CATALYST PREPARATION

Elrey L. McCann, III, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 8, 1975, Ser. No. 566,110

Int. Cl.² B01J *23/10*

U.S. Cl. 252—462 **5 Claims**

1. A process for preparing a catalyst comprising impregnating reactive alumina with a solution of metal compounds, thermally decomposable to metal oxides, in which said solution contains

A. at least one compound of a platinum group metal in a concentration sufficient to impart to the alumina about 0.001% to 5% by weight of the platinum group metal;

B. at least one compound of a lanthanide metal of atomic number 57 to 71, inclusive, in an atomic amount between about 1 and 1000 times the atomic amount of the platinum group metal; and

C. at least one compound of a metal selected from alkali and alkaline earth metals having ionic radii between about 0.9 and 1.65 Angstroms, in an atomic amount of about from 0.25 to 4 times the atomic amount of the platinum group metal; drying the resulting impregnated alumina and heating the resulting impregnated alumina at a temperature of at least about 800° C. for at least about one hour.

4,001,144

PROCESS FOR MODIFYING THE PORE VOLUME DISTRIBUTION OF ALUMINA BASE CATALYST SUPPORTS

Michael J. Pearson; Ronald J. Rigge, both of Pleasanton, and Stephen C. Carniglia, Byron, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 19, 1975, Ser. No. 642,275

Int. Cl.² B01J *21/04*

U.S. Cl. 252—463 **8 Claims**

1. A process for modifying the pore volume distribution of an alumina base catalyst support precursor which comprises the steps of:

a. treating an alumina precursor of chi-rho-eta structure with an aqueous solution of an ammonium salt selected from the group consisting essentially of ammonium carbonate, ammonium bicarbonate and mixtures thereof;

b. subjecting the treated alumina to a pressure treatment at a temperature in the range of about 100° and 160° C for a time period of about 10 hours to 24 hours;

c. drying of the pressure-treated alumina at a temperature in excess of about 100° and up to about 200° C for about 1–24 hours followed by thermal activation at a temperature of at least about 500° and not in excess of about 700° C; and

d. recovering an eta-free, alumina base catalyst support of modified pore volume distribution characterized by having at least about 70% of its total pore volume in the 45–300 angstrom unit pore diameter range.

4,001,145

GLASSY RESISTOR COMPOSITION FOR USE IN A RESISTOR INCORPORATED SPARK PLUG

Masao Sakai, Kasugai; Masaru Fukuoka, Aichi, and Katsuyoshi Hayashi, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 18, 1974, Ser. No. 524,733

Claims priority, application Japan, Nov. 21, 1973, 48-130065

Int. Cl.² H01B *1/02, 1/04;* **H01C** *1/02, 1/04*

U.S. Cl. 252—513 **5 Claims**

1. A glassy resistor composition for use in a resistor incorporated spark plug formed by mixing 100 parts by weight of a mixture of 1–40% by weight of at least one semiconductible oxide selected from group consisting of TiO_2, Nb_2O_5, ThO_2 and La_2O_3; 35–85% by weight of a glass powder; and 5–35% by weight of at least one metal powder selected from group consisting of Cu, Ag, Mn, Cr, Fe and an alloy of FeB; with 0.1–30 parts by weight of at least one powdery carbide selected from the group consisting of TiC, B_4C, SiC and TaC; serving as a reducing agent for said oxides.

4,001,146

NOVEL SILVER COMPOSITIONS

Samuel Jacob Horowitz, Snyder, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1975, Ser. No. 553,421

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01B *1/02*

U.S. Cl. 252—514 **18 Claims**

1. Silver compositions useful for forming highly adherent conductor patterns on ceramic dielectric substrates, said compositions comprising a glass-free mixture of finely divided inorganic powders dispersed in a liquid vehicle, the inorganic powders comprising, based upon the total weight of inorganic powders in the composition, 1–5% crystalline inorganic binder and 95–99% metal powder selected from among (i) Ag and (ii) Ag plus Pt, Pd, Au, an alloy of Cu with one or more of Pt,

Pd, Au, and Ag, or mixtures thereof; wherein the weight ratio of Ag to other metals is at least 17/1; and wherein said crystalline inorganic binder consists essentially of bismuth oxide plus copper oxide, or lead oxide, or mixtures thereof, there being 0.3–6 parts by weight of copper oxide and/or lead oxide per part by weight of bismuth oxide.

4,001,147

OXAZOLINE AND/OR OXAZINE-MODIFIED POLYMERS

Thomas A. Chamberlin, and Norman L. Madison, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

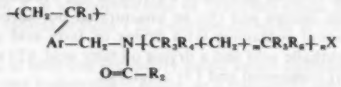
Filed Mar. 3, 1975, Ser. No. 554,380

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C08G *22/44*

U.S. Cl. 260—2.5 B 23 Claims

1. A liquid-permeable, water-insoluble, synthetic resinous body, capable of removing a phenol from a phenol solution in contact therewith, comprising a cross-linked vinyl-addition polymer whose backbone contains a plurality of units corresponding to the formula



wherein:

R_1 is hydrogen or methyl;

R_2 is hydrogen, phenyl or alkyl of from 1 to about 24 carbon atoms;

R_3–R_6 are each independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl, with the proviso that at least two of R_3–R_6 are hydrogen;

Ar is a carbocyclic aromatic nucleus;

m is 0 or 1;

n is an integer of at least 1; and

X is Cl, Br, I, or OH.

4,001,148

PROCESS FOR THE PRODUCTION OF FLAME-RESISTANT PHENOLIC RESIN FOAM PLASTICS

Dragomir Simic, Mulheim; Heinz-Ulrich Zupancic, Duisburg, and Martin Cherubim, Rheinkamp-Eick, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Germany

Filed Mar. 3, 1975, Ser. No. 554,899

Claims priority, application Germany, Mar. 21, 1974, 2413567

Int. Cl.² C08J *9/14, 9/16*

U.S. Cl. 260—2.5 F 13 Claims

1. A process for the production of a flame-resistant, phenolic resin foam plastic which comprises:

1. forming in aqueous solution an alkaline-condensed phenol-formaldehyde resin,
2. mixing with the said resin solution an expanding agent and an acidic curing agent, and
3. subjecting the mixture to foaming at a temperature of about 15° to about 80° C to form the foam plastic, and wherein the said acidic curing agent is a mixture comprising:
   a. 8 to 70 percent by volume of an aromatic sulfonic acid,
   b. 10 to 40 percent by volume of a glycol, and
   c. 20 to 80 percent by volume of an about 75 to 85 weight percent phosphoric acid.

4,001,149

NOVEL FIRE-RETARDANT POLYMER

Anthony L. Scaggs, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1975, Ser. No. 619,334

Int. Cl.² C08J *9/02;* C08F *118/14*

U.S. Cl. 260—2.5 FP 6 Claims

1. Cross-linked poly[N-(3-vinylphenyl)maleimide].

2. A process for the preparation of poly[N-(3-vinylphenyl)-maleimide] comprising polymerizing the product derived from the reaction of an aminophenyl ethanol and an unsaturated dicarboxylic anhydride, then subjecting the polymerized product to a heat source sufficient to cause cross-linking.

4,001,150

COMPOSITION FOR PREPARING ELECTROCONDUCTIVE RESIN COMPRISING AN UNSATURATED POLYESTER AND PHOSPHORIC OR SULFONIC UNSATURATED ESTER

Kiyoshi Juna; Koji Ohdan; Hiroyuki Nakayama, and Kiyohiko Asada, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Division of Ser. No. 201,991, Nov. 24, 1971, Pat. No. 3,867,351. This application Dec. 6, 1974, Ser. No. 530,148

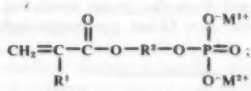
Claims priority, application Japan, Nov. 25, 1970, 45-103328; Dec. 25, 1970, 45-118132

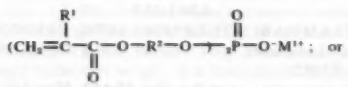
Int. Cl.² C07F *9/08;* C08L *1/10, 1/26, 1/32*

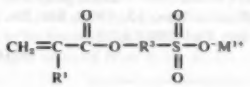
U.S. Cl. 260—17 R 10 Claims

1. An electroconductive composition which comprises:

A. at least one alkylene phosphoric ester, alkylene phosphate ester, alkylene sulfonic ester or alkylene sulfonate of acrylic acid or methacrylic acid, represented by the following formulae:







in which R^1 is hydrogen or a methyl group, R^2 is an alkylene group having 1 to 4 carbon atoms, R^3 is an alkylene group having 1 to 5 carbon atoms, and each M^1 and M^2 is hydrogen, a monovalent metal, ammonium or monoamine, and

B. unsaturated polyester of acrylic acid, methacrylic acid, α-chloroacrylic acid or α-bromoacrylic acid, and polyhydric alcohol having 2 to 4 hydroxyl groups, said polyester having at least two polymerizable ethylenically unsaturated groups.

4,001,151
ANHYDROUS PRODUCTS HAVING IMPROVED WETTABILITY CHARACTERISTICS

James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 302,162, Oct. 30, 1972, Pat. No. 3,878,138. This application Dec. 9, 1974, Ser. No. 530,580

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

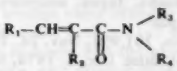
Int. Cl.² C08L *5/06, 5/04*

U.S. Cl. 260—17.4 ST **4 Claims**

1. A denture adhesive powder having superior wettability characteristics comprises a substantially anhydrous mixture of nontoxic, adhesive ingredients and from about 40% to about 60% by weight, based on the total weight of the denture adhesive ingredients of a powdered polymeric material having an average particle size of less than about 422 microns, said polymeric material being selected from the group consisting of powdered polyethylene having an average molecular weight ranging from about 1000 to about 3500 and powdered polypropylene having an average molecular weight ranging from about 120,000 to about 350,000, said denture adhesive ingredients comprising:

A. from about 5% to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one cationic polymeric material selected from the group consisting of

1. a copolymer of an acrylamide having the formula:



(I)

wherein R_1 is methyl or hydrogen; and R_2, R_3, and R_4 are each hydrogen or 1 to 7 carbon lower alkyl, with a vinyl quaternary ammonium salt selected from the group consisting of trialkylaminoalkyl acrylate salts, trialkylaminoalkyl methacrylate salts, and vinyloxyalkyltrialkylammonium salts, wherein the alkyl group contains from 1 to 7 carbon atoms; and

2. a copolymer of an acrylamide having the formula (I) above with a vinyl or alkyl-substituted vinyl pyridinum salt, wherein the alkyl group is 1 to 7 carbon lower alkyl; and

B. from about 5% to about 55% by weight, based on the total weight of the denture adhesive, of at least one anionic gum selected from the group consisting of gum karaya, gum arabic, gum Shiraz, gum tragacanth, pectin, pectinates, algin and alginates.

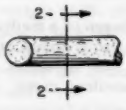
4,001,152
FLAMMABLE THERMOPLASTIC CEMENT

Horst M. Leonhardt, 6-"I" Green Knoll Circle, Brockton, Mass. 02402

Continuation-in-part of Ser. No. 37,152, May 14, 1970, abandoned. This application Nov. 13, 1972, Ser. No. 306,326

Int. Cl.² C08J *3/20*

U.S. Cl. 260—18 N **10 Claims**



1. A self-heating hot melt formulation capable of being applied without auxiliary equipment consisting essentially of an organic thermoplastic synthetic resin hot melt adhesive intimately admixed with a lesser portion by weight of fuel capable of undergoing a sustained burning upon ignition, said fuel being in such an amount that a molded shape formed from said combination of hot melt adhesive and fuel upon being ignited at one end will slowly undergo said burning causing the hot melt adhesive to melt and drip forming a deposit of molten adhesive containing a residuum of fuel which continues to undergo said burning maintaining said adhesive molten until said fuel is consummed.

4,001,153
UNSATURATED POLYESTER RESIN COMPOSITION

Akira Ogino, Osaka; Yoshikazu Nakai, Hyogo; Takeo Nakayama, and Koji Miyamura, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Dec. 13, 1974, Ser. No. 532,640

Claims priority, application Japan, Dec. 14, 1973, 48-140866

Int. Cl.² C08G *63/48*

U.S. Cl. 260—22 CB **15 Claims**

1. An air-drying unsaturated polyester resin composition for powder coating application comprising (1) a solid unsaturated polyester resin made up of (a) a polyol component containing not less than 30 mole percent of a glycol having cycloalkylene or phenylene groups and (b) an unsaturated polycarboxylic acid component containing (i) a drying oil fatty acid or (ii) tetrahydrophthalic acid and a drying oil fatty acid, (2) a solid vinyl or allyl compound and (3) a catalyst.

4,001,154
PRIMER ADHESIVE COMPOSITION

Donald L. Schmidt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 4, 1973, Ser. No. 393,853

Int. Cl.² C08L *61/20*

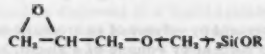
U.S. Cl. 260—29.4 UA **14 Claims**

1. A thermally-curable, film-forming, primer adhesive composition comprising an aqueous solution of

a. a water-soluble, cross-linkable polymer bearing a plurality of carboxyl groups selected from the group consisting of a copolymer of an α-olefin with maleic acid; and copolyer of a vinyl aromatic hydrocarbon with maleic anhydride, acrylic or methacrylic acid; a copolymer of acrylic or methacrylic acid with acrylamide, a vinyl ketone, vinyl alkanoate or vinyl pyrrolidone; a terpolymer of acrylic acid and styrene and an alkyl acrylate; or a partially hydrolyzed polyacrylamide having from about 5 to about 30 percent of the acrylamide moieties in the form of free carboxyl groups; or a water-soluble alkali metal or ammoniumsalt thereof, and

b. a small but sufficient amount of a water-soluble cross-linking agent to react with the carboxy groups in (a) and thereby form a water-swellable polymer, and

c. a silane corresponding to the formula $NH_2—CH_2CH_2NH)_qCH_2CH_2CH_2—Si(OR)_3$ or an N-alkylated derivative thereof or $HS—CH_2)_3Si(OR)_3$ or



wherein q is 0 to 10 and R is hydrogen, methyl or ethyl.

4,001,155
PAINT BINDERS OF MANNICH BASES AND EPOXY RESINS

Firtz Erdmann Kempter, Mannheim; Güenther Sabelus, Lambsheim, and Herbert Spoor, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 11, 1974, Ser. No. 522,629

Claims priority, application Germany, Nov. 15, 1973, 2357075

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

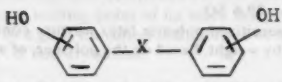
Int. Cl.² C08G *51/24*

U.S. Cl. 260—29.2 EP **3 Claims**

1. An aqueous paint binder for the cathodic electrocoating of electrically conductive metal surfaces, comprising a substantially epoxide group-free reaction product of

a. Mannich bases of

a_1.



wherein X is a straight-chain or branched-chain divalent aliphatic radical of from 1 to 3 carbon atoms or is $>SO_2$, $>SO$ or $-O-$

a_2. at least one secondary mono amine containing at least one hydroxyalkyl group, or a mixture of said secondary amine with one other secondary or primary mono amine, and

a_3. formaldehyde or a formaldehyde-donating compound, with

b. at least one epoxide resin containing 1,2 epoxide groups, the components (a) and (b) being combined in such quantities that from 0.6 to 1.3 epoxide groups of component (b) are present for each molecule of component (a_1).

4,001,156
METHOD OF PRODUCING EPOXY GROUP-CONTAINING, QUATERNARY AMMONIUM SALT-CONTAINING RESINS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 277,697, Aug. 3, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 158,063, June 29, 1971, abandoned, and Ser. No. 167,470, July 29, 1971, and Ser. No. 129,267, March 29, 1971, abandoned, and Ser. No. 100,825, Dec. 22, 1970, abandoned, and Ser. No. 100,834, Dec. 22, 1970, abandoned, said Ser. No. 158,063, is a division of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 167,470, is a continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and Ser. No. 840,848, July 10, 1969, abandoned, and Ser. No. 100,825, , and Ser. No. 100,834, , said Ser. No. 100,825, and Ser. No. 100,834, each is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned. This application Mar. 28, 1974, Ser. No. 455,686

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C08G *51/24*

U.S. Cl. 260—29.2 EP **14 Claims**

1. A method of preparing an ungelled, water-dispersible, epoxy group containing quaternary ammonium salt-containing resin comprising

A. reacting, at a temperature of about 70 to about 100°C. in the presence of about 1.75 to about 20 percent by weight based on total reaction mixture solids of water:

1. an organic polyepoxide having a 1,2-epoxide equivalent greater than 1, and
2. an amine acid salt, the weight ratio of said amine acid salt to said epoxy being from about one part to about 50 parts by weight of the salt per 100 parts by weight of epoxy; and,

B. adding to the resultant reaction product a material selected from the group consisting of aqueous boric acid solutions, boric acid, and compounds hydrolyzable to form boric acid in aqueous medium.

4,001,157
PRODUCTION OF NON-FOAMING AQUEOUS SUSPENSIONS OF POLYETHYLENE OR POLYPROPYLENE FIBRIDS

Bruno Sander, Ludwigshafen; Eckhard Bonitz, Frankenthal; Heinz Berbner, Moerlenbach, and Manfred Hoffmann, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 515,550, Oct. 17, 1974, Pat. No. 3,950,293. This application Nov. 19, 1975, Ser. No. 633,291

Claims priority, application Germany, Oct. 18, 1973, 2352190

Int. Cl.² C08L *61/20*

U.S. Cl. 260—29.4 UA **5 Claims**

1. A process for the manufacture of non-foaming aqueous suspensions of polyolefin fibrids by dispersing polyethylene fibrids or polypropylene fibrids in water in the presence of a dispersing agent, said fibrids having a specific surface area of 1–150 m^2/g, the improvement wherein the dispersing agent used consists of from 0.1 to 2.0% by weight, based on the dry weight of the fibrids, of a urea/formaldehyde polycondensate which has been modified with sodium bisulfite or a melamine/formaldehyde polycondensate which has been modified with sodium bisulfite, the molar ratio of urea to formaldehyde to sodium bisulfite and melamine to formaldehyde to sodium bisulfite being in the range of 0.1–10:0.2–20:0.01–1.

4,001,158
CRUSHED FOAM-BACKED FABRICS AND EMULSIONS FOR PRODUCING THE SAME

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Continuation-in-part of Ser. No. 433,634, Jan. 16, 1974, Pat. No. 3,933,691. This application Dec. 9, 1974, Ser. No. 530,311

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.² C08L *23/08*

U.S. Cl. 260—29.6 TA **10 Claims**

1. A foamable pigmented aqueous emulsion comprising an aqueous medium having colloidally suspended therein an emulsion copolymer consisting essentially of from 15–40% ethylene, from 1.5–9% of cross-linking monomers including at least 0.5% of monoethylenically unsaturated monomer carrying the N-methylol group, balance vinyl acetate, said copolymer having a molecular weight of at least about 300,000, said emulsion including dissolved thickener providing a viscosity of from 500 – 5,000 centipoises, added surfactant to enable the emulsion to be foamed, and dispersed pigment in a pigment to binder weight ratio of from 0.1:1 to 2:1.

4,001,159
AQUEOUS DISPERSION OF OLEFIN-ACRYLATE COPOLYMER

Shozaburo Imai, and Masaaki Hirooka, both of Ibaragi, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 353,493, April 23, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,684

Int. Cl.² C08L *23/22*

U.S. Cl. 260—29.6 TA **24 Claims**

1. An aqueous dispersion of a copolymer in water, charac-

terized in that the copolymer is an olefin-acrylate copolymer, said olefin being at least one member selected from the group consisting of olefins having 3 to 20 carbon atoms, said acrylate being at least one member selected from the group consisting of esters of acrylic acid in which the alcohol moiety is a hydrocarbon or halohydrocarbon group having 1 to 20 carbon atoms,

said copolymer containing 5 to 60 mole percent of the olefin, 40 to 95 mole percent of the acrylate and 0 to 30 mole percent of at least one member selected from the group consisting of acryloyl halides and maleic anhydride;

is present in a proportion of 1 to 300 parts by weight per 100 parts by weight of water; and

forms substantially dispersed phase, and water forms the continuous phase.

4,001,160

AQUEOUS EMULSION ADHESIVES BASED ON C_2-C_8 ETHERS OF N-METHYLOL AMIDES COPOLYMERIZED WITH VINYL ESTERS IN THE PRESENCE OF HYDROXY FUNCTIONAL PROTECTIVE COLLOIDS

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Continuation-in-part of Ser. No. 401,088, Sept. 26, 1973, Pat. No. 3,941,735. This application Feb. 18, 1975, Ser. No. 550,815

Int. Cl.² C08L *1/28, 23/08*

U.S. Cl. 260—29.6 WA **12 Claims**

1. An aqueous adhesive emulsion which develops water resistance through cure, the water of said emulsion having emulsified therein an aqueous emulsion copolymer consisting essentially of monoethylenic monomers, at least 40% up to 99.5% of the copolymer being vinyl ester of a saturated aliphatic monocarboxylic acid having up to 18 carbon atoms and from 0.5–15% of the copolymer of monomers providing thermosetting characteristics and consisting essentially of an N-methylol derivative of acrylamide or methacrylamide etherified with a C_2 – C_8 alcohol, any balance of said copolymer consisting essentially of nonreactive monoethylenic monomers copolymerizable with said vinyl ester, the monomers of said copolymer being emulsified during copolymerization by from 0.05% to 10% of an hydroxy functional protective colloid selected from the group consisting of polyvinyl alcohol and hydroxy ethyl cellulose.

4,001,161

LOW MOLECULAR WEIGHT HYDROLYZED POLYACRYLAMIDE AND USE THEREOF AS SCALE INHIBITOR IN WATER SYSTEMS

Dae Suk Song, Wyckoff, N.J.; Richard Joseph Duffy, Greenwich, Conn.; Charles Richard Witschonke, Noroton, Conn.; Arthur Maurice Schiller, Stamford, Conn., and Mark Allan Higgins, Gullford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 13, 1975, Ser. No. 586,765

Int. Cl.² C08L *33/02*

U.S. Cl. 260—29.6 H **4 Claims**

1. A process for polymerizing acrylamide to produce a hydrolyzed acrylamide polymer of 500–5000 molecular weight which comprises (1) charging to a reaction zone, equipped with a reflux condenser and containing water heated to reflux as the polymerization medium, simultaneously and continuously without external heating, separate streams of acrylamide, ammonium persulfate and a mercaptoalkanoic acid, the amounts by weight of ammonium persulfate and mercaptoalkanoic acid so charged being from about 0.05 to about 2 parts and from about 5 to about 20 parts, respectively, per 100 parts of acrylamide charged and the charging rates of the separate streams being controlled so that the introduction of all three streams starts and finishes substantially together and the heat of polymerization is sufficient to maintain reflux in the reaction zone without exceeding the capacity of the condenser to remove the heat of reaction, (2) applying heat to the reaction zone to maintain the refluxing towards the end of the addition of the three streams and (3) charging a sufficient amount of aqueous sodium hydroxide to hydrolyze from about 60% to about 90% of the amide groups of the polymer to carboxylate groups and provide a water solution of the hydrolyzed polymer product.

4,001,162

STABLE HEAT-SENSITIVE LATEX MIXTURES

Martin Matner, Odenthal; Hermann Perrey, Krefeld, and Ernst Schwinum, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 7, 1975, Ser. No. 565,402

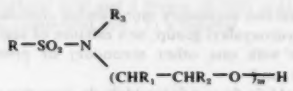
Claims priority, application Germany, Apr. 11, 1974, 2417705

Int. Cl.² C08L *33/00*

U.S. Cl. 260—29.6 SQ **3 Claims**

1. A heat-sensitized polymer latex mixture containing from 0.05 to 10% by weight, based on the polymer, of a heat-sensitizer, and

from 0.1 to 10% by weight, based on the polymer, of a sulphonamide acting as a stabilizer corresponding to the general formula:



wherein:

R represents alkyl, chloroalkyl or cycloalkyl having from 8 to 30 carbon atoms or alkaryl having from 10 to 30 carbon atoms,

R_1 and R_2 which may be the same or different, represent hydrogen, chloromethyl, methyl, ethyl or phenyl,

m is 0 or an integer from 1 to 50, and

R_3 represents hydrogen, alkyl, alkaryl, aryl or $-(CH-R_1-CHR_2-O)_m-H$ wherein R_1, R_2 and m are as defined above.

4,001,163

STYRENE-BUTADIENE COPOLYMER LATICES CONTAINING CARBOXYL GROUPS

Martin Matner, Odenthal; Ernst Schwinum, Leichlingen, and Ludwig Mott, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 11, 1975, Ser. No. 567,358

Claims priority, application Germany, Apr. 17, 1974, 2418419

Int. Cl.² C08L *25/10*

U.S. Cl. 260—29.7 T **9 Claims**

1. A carboxyl group-containing polymer latex comprising a copolymer of

73.5 to 18.5 parts by weight of butadiene,

20.0 to 80.0 parts by weight of styrene,

1.0 to 4.0 parts by weight of acrylic acid,

0.5 to 6.0 parts by weight of methacrylic acid,

0 to 10.0 parts by weight of acrylonitrile and

0 to 5.0 parts by weight of at least one ethylenically unsaturated carboxylic acid amide or methylol derivative thereof

and, as the sole emulsifier in said latex, less than 0.5 parts by weight, per 100 parts by weight of copolymer, of at least one anionic emulsifier.

4,001,164

FAST DRYING INK

Victor Fu Hua Chu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 537,597, Dec. 30, 1974, abandoned, and a continuation-in-part of Ser. No. 324,825, Jan. 18, 1973, abandoned. This application July 2, 1975, Ser. No. 592,658

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08K 5/11, 5/12

U.S. Cl. 260—31.8 N 19 Claims

1. A liquid ink composition of low volatility consisting essentially of

A. a colorant;

B. as a film former, 15–40% by weight of the composition of a compound of classes II through X; and

C. a carrier having a vapor pressure of less than about 10 mm./Hg. at 20°C., and most of which will separate from the composition by migration into the substrate to which the composition is applied,

the film derived from the composition under normal use conditions having a melting point of no more than about +18°C. if crystalline or a glass transition temperature of no more than about −18°C. if non-crystalline.

4,001,165

RAPID SETTING POLYURETHANES FROM DIOLS AND POLYFUNCTIONAL ISOCYANATES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 358,245, May 7, 1973, Pat. No. 3,801,532, which is a continuation-in-part of Ser. No. 205,697, Dec. 7, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 423,373

Int. Cl.² C08K 5/01

U.S. Cl. 260—33.6 UB 18 Claims

1. A rigid, non-cellular composition having a density of at least about 1 gram/cc which is demoldable, without the application of an external source of heat, within about 5 minutes after admixture of the components of the composition which is the reaction product of a polyurethane-forming composition comprising

A. a dihydroxyl-containing compound having a hydroxyl equivalent weight of less than about 250;

B. an organic polyisocyanate having an NCO functionality of at least about 2.5;

C. a liquid modifier compound having a boiling point of at least about 150° C or mixture of such compounds and which moderates the reaction exotherm between components (A), (B) and (D) without substantial reaction therewith selected from the group consisting of aromatic compounds free from ester groups, partially hydrogenated aromatic compounds free from ester groups, and mixtures thereof; and

D. an organometallic catalyst;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1, component (C) is present in quantities of from about 10 to about 50 percent by weight of the combined weights of components (A), (B) and (C); and component (D) is present in quantities of from about 0.01 to about 10 percent by weight of the combined weight of components (A), (B) and (C).

4,001,166

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 405,244

Int. Cl.² C08K 5/01

U.S. Cl. 260—33.6 UB 31 Claims

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture of the components of a rapid-setting polyurethane-forming composition comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of aromatic compounds free from ester groups, and groups reactive with NCO groups and mixtures thereof; and

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C).

4,001,167

ADHESIVE COMPOSITIONS COMPRISING AROMATIC PROCESS OIL AND BLOCK COPOLYMER

Barry F. Tungseth, St. Paul, and James A. Lindlof, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1969, Ser. No. 852,256

Int. Cl.² C08K 5/01

U.S. Cl. 260—33.6 AQ 9 Claims

1. A self-healing tacky adhesive composition consisting essentially of: a major proportion of an aromatic hydrocarbon process oil having a viscosity of at least about 250 (SSU/210° F.), an initial boiling point of at least about 700° F., and an aromatic content (clay-gel method) of at least about 50%; and a minor proportion of a block copolymer having an average molecular weight of at least about 85,000 and having the type formula A-B-A wherein the A components account for about 10–40 percent of the total, each A represents a non-elastomeric vinyl arene polymer block having an average molecular weight of about 5,000 to about 125,000, and B represents an elastomeric conjugated diene polymer block having an average molecular weight of about 75,000 to about 250,000; the amount of said copolymer being between about 35 and about 45 parts per 100 parts of said oil; and said composition having the following properties when tested as described in the specification:

adhesion	at least	10 gm./sq.cm.
tensile	at least	4 psi
elongation	at least	100 %
brittle point	not above	20° F.
slump	not more than	1/8 inch

4,001,168
TRANSPARENT STORAGE-STABLE POLYSILOXANES WHICH CROSS-LINK UNDER ATMOSPHERIC CONDITIONS

Günther Maass, Cologne; Hans Joachim Lücking, Bergisch-Neukirchen; Hans Sattlegger, Odenthal-Gloebusch, and Karl-Heinz Rudolph, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 18, 1975, Ser. No. 559,473

Claims priority, application Germany, Mar. 22, 1974, 2413850

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **6 Claims**

1. A polysiloxane composition which can be cross-linked under atmospheric conditions to a transparent silicone elastomer and which consists essentially of:

a. 100 parts by weight of an α,ω-dihydroxymethylphenylpolysiloxane with about 7–15 mole % of diphenylsiloxy units or about 14–28 mole % of methylphenylsiloxy units, and having a viscosity of between about 1,000 and 500,000 cSt (at 20° C),

b. about 1 to 40 parts by weight of an uncoated reinforcing filler consisting essentially of SiO_2 having a specific surface area of about 40 to 500 m^2/g by the BET method, and

c. about 1 to 100 parts by weight of a cross-linking agent of the formula

$$RSiX_3$$

wherein

R is an alkyl, alkenyl, halogenoalkyl, phenyl or phenylalkyl radical having up to 6 carbon atoms in each alkyl or alkenyl moiety, or cyclohexyl, and

X is an alkoxy or alkylamino radical having up to 6 carbon atoms in each alkyl moiety, a lower acyloxy radical or an oxime radical of an alkyl ketone or aldehyde having up to 4 carbon atoms.

4,001,169
COLORATION OF POLYESTERS

Ian Cheetham; Kenneth Dunkerley; Colin William Greenhaigh; James Albert Moyse, and David Francis Newton, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

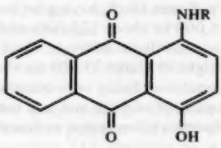
Filed Feb. 26, 1974, Ser. No. 445,837

Claims priority, application United Kingdom, Mar. 2, 1973, 10234/73

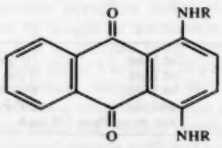
Int. Cl.² C08K *5/08*

U.S. Cl. 260—40 P **6 Claims**

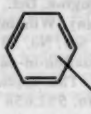
1. A process for mass colouring synthetic linear polyesters which process comprises incorporating into a preformed polyester a mixture comprising a first dyestuff of the formula:



and a second dyestuff of the formula



wherein R is a group of the formula



and X is an acylamino radical which is free from hydroxy or carboxylic acid groups.

4,001,170
PROCESS FOR BULK DYEING HIGH MOLECULAR ORGANIC COMPOUNDS

Arnold Wick, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 1, 1974, Ser. No. 485,188

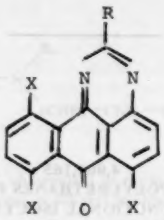
Claims priority, application Switzerland, July 4, 1973, 9769/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C08K *5/35*

U.S. Cl. 260—40 P **6 Claims**

1. A process for bulk dyeing high molecular organic compounds characterized by employing anthrapyrimidines of the formula



as the dyestuffs wherein R is an aromatic radical, one X is an arylamino group, and the remaining X groups are hydrogen atoms.

4,001,171
POLYMERIC FIBERS CONTAINING COLOR CONCENTRATES

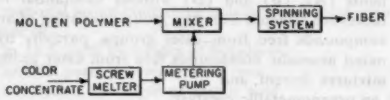
Ram-Tirth Khanna, Linden Heath, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 414,287, Nov. 9, 1973, Pat. No. 3,905,937, which is a continuation-in-part of Ser. No. 241,253, April 5, 1972, abandoned. This application June 26, 1975, Ser. No. 590,502

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08K *9/04*

U.S. Cl. 260—40 R **9 Claims**



1. A polymeric fiber containing enough of a composition comprising, as essential components,

A. colorant, 1–80% by weight;

B. 1–25% by weight of a deflocculating agent of Class I through Class X; and

C. a polymeric carrier, not of Class I through Class X in (B), compatible with the fiber-forming polymer,

to provide 0.05–5%, by weight of the fiber, of colorant.

4,001,172

POLYMERS WITH IMPROVED PROPERTIES AND PROCESS THEREFOR

Robert A. Steinkamp, and Thomas J. Grail, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 240,494, April 3, 1972, Pat. No. 3,862,265, and a continuation-in-part of Ser. No. 132,838, April 9, 1971, abandoned. This application July 10, 1974, Ser. No. 487,070

Int. Cl.² C08K *7/14, 3/04;* **C08F** *255/02, 255/08*

U.S. Cl. 260—42.18 **20 Claims**

1. A masterbatch comprising 50 to 90 wt. percent of a grafted polymeric composition, prepared from a base polyolefin polymer, comprising from 0.02 to 20 weight percent of grafted compound and having a melt flow rate of from 3 to 1000 and at least 50% higher than said base polymer and a die swell of at least 0.05 unit less than that of said base polymer and 10 to 70 weight percent of conventional additive for polyolefins selected from the group consisting of heat stabilizers, slips agents, antioxidants, anti-static agents, colorants, flame retardants, plasticizers, preservatives, processing aids, and fillers.

4,001,173

PROCESS FOR PRODUCING VINYL POLYMERS

Alexandr Evgenievich Chuchin, Petrovsko-Razumovsky proezd, 20, kv. 52; Leonid Leonidovich Proskurin, 2 Sinichkina ulitsa, 26, kv. 76; Irina Jurievna Kalnova, Teply Stan, 3 mikroraion, korpus 41, kv. 97, and Vladimir Viktorovich Rozhkov, shosse Entuziastov, 212, korpus 4, kv. 474, all of Moscow, U.S.S.R.

Filed Jan. 22, 1975, Ser. No. 543,049

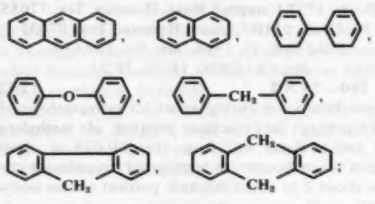
Int. Cl. C08k *3/00*

U.S. Cl. 260—45.7 R **4 Claims**

1. In a process for polymerizing vinyl monomers, the improvement which comprises carrying out the polymerization in the presence of aromatic compounds selected from the group consisting of (1) polyarylenealkylenes of the formula:

$$\text{—}\left(\text{Ar}_1\text{—CH}_2\right)_k\text{—}_m \qquad \text{Ar}_2\text{—}\left(\text{CH}_2\right)_k\text{Ar}_1\text{—}_n,$$

wherein Ar_1 and Ar_2 are



$m + n = 2$ to 30; k is an integer of 1 and 2; and when $k = 1$, Ar_1 and Ar_2 are also

where X is H or a C_1–C_4 alkyl; and (2) hydroperoxides of said polyarylenealkylenes said aromatic compounds being used in an amount within the range of from 0.01 to 15% by weight of the starting vinyl monomers.

4,001,174

INCOMBUSTIBLE POLYOLEFIN MOLDING COMPOSITIONS AND METHOD OF CROSSLINKING SAME

Kiyoshi Yagi, Susono, and Miyoshi Yamamoto, Gotenba, both of Japan, assignors to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,511

Int. Cl.² C08K *5/02, 5/03, 3/22*

U.S. Cl. 260—45.7 R **14 Claims**

1. An incombustible polyolefin molding composition characterized by comprising 100 parts by weight of a polyolefin, 1–35 parts by weight of zirconium oxide, 50–100 parts by weight of a compound selected from the class consisting of aluminum hydroxide and aluminum oxide and 1–75 parts by weight of chlorine-containing hydrocarbon having a chlorine content of less than 50% by weight.

4,001,175

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 29, 1975, Ser. No. 626,938

Int. Cl.² C08K *5/42*

U.S. Cl. 260—45.7 S **13 Claims**

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of aromatic sulfoxides, and mixtures thereof, wherein said metal salts are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic sulfoxides is selected from the group consisting of alkyl radicals and electron withdrawing radicals and mixtures thereof.

4,001,176

RING PHOSPHONATES AS FLAME-RETARDANTS

James S. Clovis, and Francis R. Sullivan, both of Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 139,949, May 3, 1971, Pat. No. 3,812,219. This application Apr. 26, 1973, Ser. No. 354,730

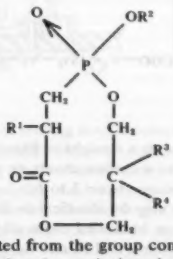
Int. Cl.² C08K *5/53*

U.S. Cl. 260—45.8 R **6 Claims**

1. As an article of manufacture, an acrylic composition comprising an addition polymer formed from a mixture comprising:

a. at least 50 percent by weight of methyl methacrylate; and

b. 5 to 30 percent by weight of a flame-resistant phosphorus compound defined by the general formula:



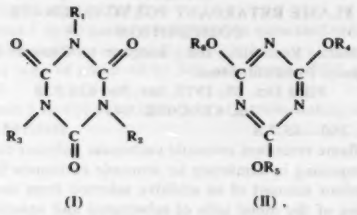
wherein R^1 is selected from the group consisting of hydrogen and methyl, R^2 is phenyl or substituted phenyl wherein the substitution is one or more of halogen, nitro, lower alkyl, cyclohexyl, alkoxy, naphthoxy, or phenoxy, and R^3 and R^4 are the same or different and are lower alkyl of up to 8 carbon atoms.

4,001,177
FLAME-RETARDING POLYAMIDE COMPOSITION

Tadao Tsutsumi, Nagoya; Nobuo Kato, Aichi; Masanobu Morikawa; Toshikazu Aoyama, both of Nagoya, and Kazumi Nagai, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 3, 1975, Ser. No. 628,338
Claims priority, application Japan, Nov. 7, 1974, 49-127521
Int. Cl.² C08K *5/34*
U.S. Cl. 260—45.8 NT **9 Claims**

1. A flame-retarding polyamide composition which comprises polyamide having receiving amide groups as integral parts of the main polymer chain, about 3 to 40% by weight of melamine on the basis of the polyamide, and about 0.5 to 20% by weight on the basis of the polyamide and about 2 to 75% by weight on the basis of melamine of a compound represented by a compound selected from the group consisting of the following formulas (I) and (II):



(I) (II),

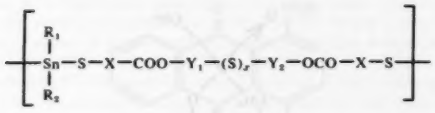
wherein R_1, R_2, R_3, R_4, R_5 and R_6 are the same or different radicals selected from the group consisting of hydrogen, alkyl, alicyclic and aromatic radicals having from 1 to 10 carbon atoms, and from such radicals having a substituent selected from the group consisting of —OH, —COOR′ and —$CONH_2$, wherein R′ is aliphatic alkyl group having from 1 to 5 carbon atoms.

4,001,178
ORGANO-TIN MERCAPTIDES WITH POLYSULPHANEDIYL GROUPS

Georges Bakassian, Les Lyon, and Michel Gay, Lyon, both of France, assignors to Rhone-Poulenc, Paris, France

Filed May 10, 1974, Ser. No. 468,997
Claims priority, application France, May 14, 1973, 73.17326
Int. Cl.² C08K *5/58*
U.S. Cl. 260—45.75 S **7 Claims**

1. An organo-tin mercaptide consisting essentially of groups of the formula:

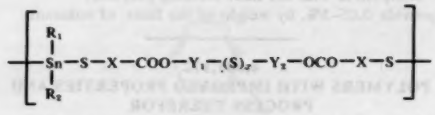


in which X represents a straight or branched chain alkylene group with up to 4 carbon atoms or a phenylene group;

x represents an integer from 2 to 6;

Y_1 and Y_2, which may be identical or different each represents a straight or branched chain alkylene group with at most 6 carbon atoms, and R_1 and R_2, which may be identical or different, each represents a straight or branched chain alkyl group with 1 to 10 carbon atoms.

2. A halogenated vinyl resin containing 0.2 to 3% by weight of an organo-tin mercaptide consisting essentially of groups of the formula:



in which X represents a straight or branched chain alkylene group with up to 4 carbon atoms or a phenylene group;

x represents an integer from 2 to 6;

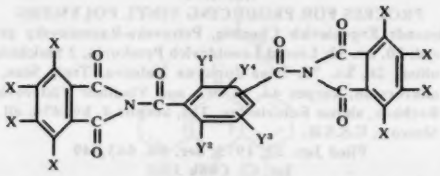
Y_1 and Y_2, which may be identical or different each represents a straight or branched chain alkylene group with at most 6 carbon atoms, and R_1 and R_2, which may be identical or different, each represents a straight or branched chain alkyl group with 1 to 10 carbon atoms.

4,001,179
BIS-(TETRAHALOPHTHALIMIDOCARBONYL)-BENZENE

Sidney B. Richter, Chicago, and Glendon D. Kyker, Glen Ellyn, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 21, 1975, Ser. No. 560,453
Int. Cl.² C07D *209/48*; **C08K** *5/00*
U.S. Cl. 260—45.75 B **13 Claims**

1. A compound of the formula



wherein X is chlorine or bromine and each of Y^1, Y^2, Y^3 and Y^4 are hydrogen, chlorine or bromine.

7. A fire retardant polymeric composition comprising a combustible polymer and a fire retarding amount of a compound of claim 1.

4,001,180
POLYURETHANE CURING AGENT

Earl N. Doyle, 1737 Campbell Road, Houston, Tex. 77055, and Anna W. Crull, 6110 Cheena, Houston, Tex. 77035

Filed Feb. 27, 1975, Ser. No. 553,652
Int. Cl.² C08G *18/30*, *18/32*
U.S. Cl. 260—75 NH **12 Claims**

1. A polyfunctional curing agent for polyurethane elastomers comprising the reaction product of methylene bis (methyl anthranilate) and from about 0.025 to about 0.1 equivalents of an isocyanate-terminated prepolymer containing from about 2 to about 10 mole percent excess isocyanate groups.

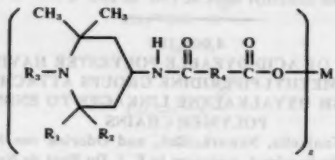
4,001,181
HINDERED PIPERIDINE CARBOXAMIDE ACIDS, METAL SALTS THEREOF, AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,327, Dec. 28, 1973, Pat. No. 3,907,803. This application July 30, 1975, Ser. No. 600,234
Int. Cl.² C08K *5/34*
U.S. Cl. 260—45.75 N **9 Claims**

1. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer

normally subject to ultraviolet deterioration containing from 0.005 to 5% of a stablizing compound of the formula:



(1)

wherein

R_1 and R_2 independently of each other are straight- or branched-chain lower alkyl having 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl, or alkyl substituted benzyl,

R_4 is straight- or branch-chain alkylene having 1 to 8 carbon atoms, phenylene, phenylene substituted with one or more alkyl groups, or the group $-(CH_2)_mY(CH_2)_n-$, wherein Y is oxygen or sulfur and m and n independently of each other are an integer of from 1 to 3,

M is hydrogen or a metal selected from the group consisting of barium, nickel, manganese, calcium, zinc, iron, sodium, cobalt, tin, dialkyl tin and

z has a value of from 1 to 4, the value of z being the same as the available valence of M.

4,001,182

FLAME RETARDANTS FOR POLYMERS

Timothy P. Murtha, and Roy A. Gray, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1972, Ser. No. 236,342

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.85 R **5 Claims**

1. A flame-retardant composition comprising 1,11-diacetoxy-6-acetoxymethyl-2,2,6,10,10-penta(bromomethyl)-4,8-dioxaundecane and a synthetic polymer plastic.

4,001,183

TETRAPHENOL CONTAINING POLYCARBONATES

Dieter Freitag; Ulrich Haberland, and Heinrich Krimm, all of Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 404,557, Oct. 9, 1973, which is a division of Ser. No. 285,699, Sept. 1, 1972, Pat. No. 3,799,953, which is a continuation-in-part of Ser. No. 178,443, Sept. 7, 1971, abandoned. This application Mar. 13, 1975, Ser. No. 558,049

Claims priority, application Germany, Mar. 19, 1971, 2113347

Int. Cl.² C08G 63/62

U.S. Cl. 260—47 XA **9 Claims**

1. A high molecular weight, branched polycarbonate substantially free of crosslinking which comprises a polycarbonate polymer containing residues of an aromatic dihydroxy compound, about 0.01 to about 1 mol percent of residues of 1,4-bis(4',4''-dihydroxy-triphenylmethyl)-benzene and about 0.1 to 8 mol percent of monohydric phenol, the mol percentages being based on the mols of the aromatic dihydroxy compound, said branched polycarbonate having a relative viscosity of from 1.2 to about 1.55 measured on a solution of 0.5 gram in 100 ml of methylene chloride at 20° C, an average molecular weight of between about 30,000 and about 100,000, measured by light diffusion and a melt viscosity of between 20,000 and about 300,000 poises at 280° C.

4,001,184

PROCESS FOR PREPARING A BRANCHED POLYCARBONATE

Steven William Scott, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 31, 1975, Ser. No. 563,494

Int. Cl.² C08G 17/13

U.S. Cl. 260—47 XA **14 Claims**

1. A process for preparing a thermoplastic randomly branched aromatic polycarbonate having improved resistance to thermal oxidation and having excellent blow molding properties which process comprises reacting at least 20 weight percent of a stoichiometric quantity of a carbonate precursor with a mixture of a dihydric phenol and at least 0.05 mole percent of a polyfunctional aromatic compound in a medium of water and an inert organic solvent for the polycarbonate having present therein at least 1.2 mole percent of a polymerization catalyst, a molecular weight regulator, and an inert organic solvent for the polycarbonate while concomitantly adding to the reaction medium sufficient alkali metal hydroxide to maintain a pH range of about 3.0 to about 6.0, and then adding sufficient alkali metal hydroxide to raise the pH to at least 9.0 but less than about 12.0 while reacting the remaining amount of the stoichiometric quantity of the carbonate precursor; said polyfunctional aromatic compound containing at least three functional groups selected from the group consisting of carboxyl, carboxylic anhydride and haloformyl or mixtures thereof.

4,001,185

ACCELERATION SENSING DEVICE

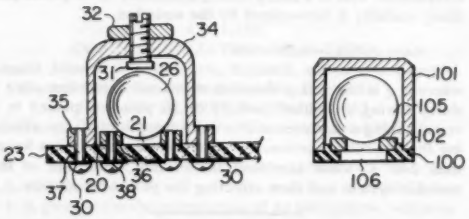
Tatsuo Mitsui, Hirakata; Okihiko Nakano, Katano, and Itaru Mitsugi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 18, 1973, Ser. No. 370,637

Claims priority, application Japan, June 28, 1972, 47-65274; July 20, 1972, 47-86117[U]; July 31, 1972, 47-90743[U]; Aug. 18, 1972, 47-96900[U]; Aug. 22, 1972, 47-98351[U]; Nov. 10, 1972, 47-130227[U]; Nov. 10, 1972, 47-130228[U]; Jan. 20, 1973, 48-9511[U]; Feb. 19, 1973, 48-21437[U]; Feb. 23, 1973, 48-23748[U]; May 18, 1973, 48-58929[U]

Int. Cl.² H01H 35/14, 1/16

U.S. Cl. 200—61.45 R **23 Claims**



1. An acceleration sensing device comprising an electrically conductive horizontally disposed cylindrical non-magnetic support ring having a hole of predetermined radius, an insulating substrate supporting said support ring, an electrically conductive sphere having a radius larger than that of the hole of said support ring and placed on the upper inner periphery of said support ring, an electrically conductive contact member, and means supporting said contact member fixedly above said sphere and spaced therefrom when the sphere is normally on the support ring, said contact member having an axis substantially coaxial with the axis of the hole in said support ring, thereby establishing an electrical path between said support

ring and said contact member when an acceleration having a horizontal component greater than a predetermined value is applied to the sphere causing it to pivot on the inner edge of said support ring to make contact with the contact member.

4,001,186

PREPARATION OF POLYIMIDE FROM ORGANIC DIISOCYANATE WITH ALKALI METAL SALT OF ALCOHOL AS CATALYST

Besir K. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 7, 1974, Ser. No. 521,744

Int. Cl.² C08G *18/06, 73/14*

U.S. Cl. 260—63 N **13 Claims**

1. In a process for preparing an essentially linear dipolar aprotic solvent soluble solid polyimide by the condensation of an organic diisocyanate with a polycarboxylic compound containing two intramolecular carboxylic anhydride groups or free carboxylic acids thereof under anhydrous conditions in said solvent, the improvement which comprises carrying out said process in the presence of a catalytic amount of a compound MOR, wherein R represents alkyl or aryl, and M is an alkali metal and at a temperature of from about 40° C to about 140° C.

4,001,187

METHOD OF PRODUCING POLYESTERS TEREPHTHALIC ACID AND ETHYLENE GLYCOL

Yoshio Itabashi; Kentaro Noguchi, and Masao Seki, all of Hofu, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Continuation of Ser. No. 250,345, May 4, 1972, abandoned. This application July 11, 1974, Ser. No. 487,755

Claims priority, application Japan, Dec. 29, 1971, 47-34491; Mar. 13, 1972, 47-25405; Mar. 13, 1972, 47-25406

Int. Cl.² C08G *63/18*

U.S. Cl. 260—75 M **28 Claims**

1. A method of producing polyethylene terephthalate from terephthalic acid and ethylene glycol, which comprises continuously feeding a slurry of terephthalic acid in ethylene glycol having a molar ratio of ethylene glycol to terephthalic acid of not more than 1.3, into a reaction system containing at least one of bis-(β-hydroxyethyl) terephthalate and oligomers thereof, said terephthalic acid having a slurry forming ability of not more than 0.48, a slurry stability of not less than 60%, 4-carboxybenzaldehyde content of not more than 600 ppm and a *b* value of not more than 2.0, wherein slurry forming ability is defined as the weight ratio of ethylene glycol to terephthalic acid in a slurry having a viscosity of 30 poises and slurry stability is determined by the equation

$$\text{slurry stability} = \eta/30 \times 100$$

wherein η is the slurry viscosity measured 5 minutes after a slurry having an initial viscosity of 30 poises is placed in a vessel having a diameter of 75 mm to a depth of 10 cm; effecting the esterification reaction at a temperature of not lower than 240° C while removing the formed water out of the reaction system and then effecting the polycondensation.

4,001,188

DIMETHYL 2,5-DIBROMOTEREPHTHALATE ESTERIFICATION

James P. Nelson, Woodridge, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 263,199, June 15, 1972, abandoned. This application Feb. 27, 1975, Ser. No. 553,828

Int. Cl.² C08G *63/34, 63/68*

U.S. Cl. 260—75 H **3 Claims**

1. A process for the preparation of homopolymeric trimethylene 2,5-dibromoterephthalate comprising reacting dimethyl 2,5-dibromoterephthalate with trimethylene glycol in the presence of 0.01 to 0.20% calcium salt of saturated aliphatic acids containing 2 to 8 carbon atoms based on the weight of dimethyl ester and 0.01 to 0.20% tetraalkyl titanate based on the weight of dimethyl ester at 150° to 265° C.

4,001,189

FIBERS OF ACID-DYEABLE POLYESTER HAVING TETRAMETHYLPIPERIDINE GROUPS ATTACHED THROUGH OXYALKALENE LINKAGES TO ENDS OF POLYMER CHAINS

Murty S. Tanikella, Newark, Del., and Odorich von Susani, Geneva, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 505,953, Sept. 13, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,700

Claims priority, application Germany, Sept. 17, 1973, 2346734

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **10 Claims**

1. Acid-dyeable textile fibers or filaments of polyester containing a minor proportion, sufficient to provide at least 0.02 weight percent nitrogen, of 2,2,6,6-tetramethylpiperidine groups attached through oxyalkylene linkages to carboxylate units at the ends of polyester chains, said linkages being through the 1 or 4 positions of the tetramethylpiperidine ring, the oxyalkylene linkages consisting of oxyethylene or oxyethylene and oxypropylene, and there being an average of at least about 10 oxyalkylene units per tetramethylpiperidine group of which at least 5 are oxyethylene units.

4,001,190

ACID-DYEABLE FIBERS OF POLYESTER MODIFIED WITH TETRAMETHYLPIPERIDINE POLYETHER GLYCOLS

Murty S. Tanikella, Newark, Del., and Odorich von Susani, Geneva, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 505,952, Sept. 13, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,701

Claims priority, application Germany, Sept. 17, 1973, 2346734

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **10 Claims**

1. Acid dyeable polyester fibers or filaments comprising, as integral components in linear polyester chains, a minor proportion sufficient to provide at least 0.05 weight percent nitrogen, of 2,2,6,6-tetramethylpiperidine groups linked to dicarboxylate chain units through substituents at both the 1 and 4 positions of the piperidine ring which contain oxyethylene units, and the number of oxyethylene units in such linking substituents on tetramethylpiperidine groups in the polyester averages at least 10 oxyethylene units per tetramethylpiperidine group.

4,001,191

COMBUSTIBLE MONOMERS AND POLYMERS THEREFROM

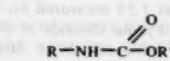
Samuel F. Reed, Jr., Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 785,523, Jan. 7, 1959, abandoned. This application Oct. 18, 1960, Ser. No. 63,443

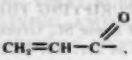
Int. Cl.² C08F *18/24*

U.S. Cl. 260—77.5 BB **15 Claims**

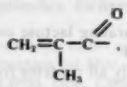
2. Carbamates of the general formula:



in which R is selected from the group consisting of



and



and R′ is selected from the group consisting of

$(CH_2ONO_2)\ 3C-CH_2-$,

$(C_2B_{10}H_{11}-CH_2)_2CH-$,

$(C_2B_{10}H_{11})_2CH-$,

and

$C_2B_{10}H_{11}(CH_2)_n-$,

in which n is 1 to 4.

15. A copolymer of at least one of the monomers of claim 2 with at least one monomer selected from the group consisting of methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, the higher alkyl esters of methacrylic and ethacrylic acids and mixtures thereof.

4,001,192
TRANSPARENT POLYAMIDES FROM BIS(AMINOMETHYL)-NORBORNANES

Eckart Reske, Hofheim, Taunus; Ludwig Brinkmann, Frankfurt am Main; Hartmut Fischer, Kelkheim, Taunus, and Freimund Röhrscheid, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 306,202, Nov. 14, 1972, Pat. No. 3,876,585. This application Oct. 30, 1974, Ser. No. 519,244

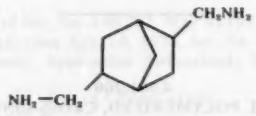
Claims priority, application Germany, Nov. 16, 1971, 2156723

Int. Cl.² C08G *20/20*

U.S. Cl. 260—78 R **4 Claims**

1. A transparent polyamide having improved toughness and a reduced specific viscosity of 0.5 to 4.0 dl/g measured at a 1% concentration of the polyamide in phenol/tetrachloroethane in a weight ratio of 3:2 at 25° C., said polyamide consisting essentially of the polymeric polycondensation product

a. a mixture of bis-(aminomethyl)-norbornanes of the formulae



and

b. one or more aromatic carbocyclic dicarboxylic acids of 7 to 20 carbon atoms,

c. one or more aliphatic dicarboxylic acids of 2 to 20 carbon atoms, and

d. one or more aliphatic diamines of 2 to 20 carbon atoms, said diamines and said dicarboxylic acids being present in approximately stoichiometric proportions and said aliphatic diamine being used in an amount of no more than 80 mole percent of the total diamine.

4,001,193
ANIONIC SIZES

Wulf von Bonin, Leverkusen; Friedhelm Müller, Odenthal, and Nikolaus Schön, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 28, 1974, Ser. No. 437,209

Claims priority, application Germany, Jan. 31, 1973, 2304535

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² C08F *222/16, 220/06*

U.S. Cl. 526—26 **3 Claims**

1. A copolymer, which is suitable for use in anionic sizes, which is an ammonium or alkali metal salt of a copolymer consisting of

a. 0.5 to 50% by weight of copolymerized units of at least one half ester of an α,β-olefinically unsaturated C_4 or C_5 dicarboxylic acid and an aliphatic or cycloaliphatic alcohol having 1 to 18 C-atoms,

b. 6 to 40% by weight of copolymerized units of at least one acid selected from the group consisting of acrylic acid and methacrylic acid and

c. 40 to 85% by weight of copolymerized units of an aromatic compound which contains a single polymerizable double bond.

4,001,194
PROCESS FOR POLYMERIZING METALLOCENES

F. Louis Floyd, Strongsville, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed Nov. 11, 1974, Ser. No. 522,446

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² C08F *30/04*

U.S. Cl. 526—240 **5 Claims**

1. In a process for the polymerization of a metallocene compound that is polymerizable by free radical polymerization and has a metal nucleus in a state of oxidation below maximum, the improvement for suppressing oxidation of the metal nucleus of said metallocene which comprises:

forming a reaction mixture containing said metallocene and the reducing agent of a redox catalyst combination;

then initiating and maintaining polymerization of said metallocene with the gradual addition of the oxidizing agent of said combination to said reaction mixture.

4,001,195
COPOLYMERIZATION OF OLEFINS

Ronald John Wyatt, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 14, 1972, Ser. No. 271,743

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C08F *210/00, 212/00*

U.S. Cl. 526—348 **12 Claims**

1. A process for the preparation of an amorphous, vulcanisable, elastomeric copolymer of ethylene and propylene in a proportion in the range 20:80 to 80:20 parts by mole by copolymerisation of ethylene and propylene in the presence of, as polymerisation catalyst, a transition metal composition which is the product of reacting a transition metal complex of the general formula

$$R_nMX_p \qquad (1)$$

with a substantially inert matrix material having a hydroxylic surface which is free from adsorbed water, wherein M is a transition metal of Groups IVA to VIA of the Periodic Table of the Elements, R is a hydrocarbon group or substituted

hydrocarbon group, X is a monovalent ligand and *m* and *p* are integers, *m* having a value from 2 to the highest valency of the metal M, and *p* having a value from 0 to 2 less than the valency of the metal M, the copolymerisation process being effected at a temperature in the range of 10° to 80°C in a diluent consisting essentially of propylene or mixture thereof with another α-olefin which is in liquid form under the prevailing polymerisation conditions and in which the catalyst and copolymer are insoluble.

4,001,196

REACTIVATION OF ORGANOCHROMIUM OLEFIN POLYMERIZATION CATALYST IN PRESENCE OF OXYGEN

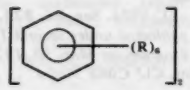
Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1974, Ser. No. 529,534
Int. Cl.² C08F *4/02, 4/22, 110/02*
U.S. Cl. 526—348 **18 Claims**

1. A process for producing a catalyst comprising:

calcining a silica-containing particulate support containing titanium in air at a temperature within the range of 700 to 2000° F.;

thereafter impregnating the thus-calcined titanium-containing support with a nonaqueous solution of a diarene organochromium compound having the following structure



wherein R is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 6 carbon atoms; and

thereafter treating the thus organochromium impregnated support with molecular oxygen at a temperature within the range of 40° to 150° F.

4,001,197

MAGNETIC SEPARATION METHOD

Ralph Mitchell, Lexington, and Ilan Chet, Cambridge, both of Mass., assignors to Sala Magnetics, Inc., Cambridge, Mass.

Filed June 12, 1975, Ser. No. 586,520
Int. Cl.² A23J *1/18*
U.S. Cl. 260—112 R **14 Claims**

1. A magnetic separation method for recovering single cell protein from single cell organisms comprising:

dispersing magnetic seed in a fluid medium containing single cell organisms, to allow attachment of the magnetic seed to the single cell organisms in the mixture to occur;

submitting the mixture to a magnetic separator to entrap and hold by magnetic forces in the magnetic separator the magnetic seed and attached single cell organisms, to concentrate the single cell organisms;

lysing the entrapped single cell organisms to break the cell walls of the single cell organisms and release protein from the single cell organisms into the fluid medium; and

recovering the released protein in the fluid medium by discharging the fluid medium from the magnetic separator while the seed and remaining portions of the cells which are attached to the magnetic seed are held by the magnetic forces.

4,001,198

METHOD OF RECOVERING NUTRIENTS FROM CHEESE WHEY AND PURIFYING THE EFFLUENT

Frank A. Thomas, 309 Reese St., Greenwood, Wis. 54437

Continuation-in-part of Ser. No. 483,912, May 28, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,843
Int. Cl.² A23J *3/00;* A23C *21/00*
U.S. Cl. 260—112 R **21 Claims**

1. A method of separating lactose constituents from whey comprising the steps of:

removing substantially all proteins from the whey,

separating and concentrating the milk sugar constituents from the remaining whey constituents by the process of ultrafiltration using membranes substantially impermeable to whey sugar but permeable to the water, salt and ash constituents of whey,

washing the whey sugar concentrate, reconcentrating said whey sugar concentrate, and drying the twice concentrated whey sugar concentrate.

4,001,199

NOVEL POLYPEPTIDES USEFUL FOR TREATING DIABETES AND HYPERCHOLESTEREMIA

Masahiko Fujino, Takarazuka; Mitsuhiro Wakimasu, Osaka; Shigehisa Taketomi, Osaka, and Eiichiro Ishikawa, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 19, 1975, Ser. No. 560,092
Claims priority, application Japan, Mar. 26, 1974, 49-34161; Jan. 24, 1975, 50-10878
Int. Cl.² C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R **58 Claims**

1. A compound of the formula

$$R_1\text{-Arg-}R_2\text{-Phe-Phe-}R_3 \qquad (I)$$

wherein R_1 is hydrogen, or a basic or neutral amino acid residue having not more than 10 carbon atoms, R_2 is a neutral amino acid residue having not more than 10 carbon atoms and R_3 is NH_2, Tyr-NH_2, a residue of Tyr¹-peptide consisting of 2 to 5 amino acid residues, each of the amino acid residues having 2 to 10 carbon atoms, or R_3 is a residue of an amide of the Tyr¹-peptide, provided that when R_1 is hydrogen, R_2 is Pro and that when any of the amino acid residues constituting the compound of the formula (I) is an optical isomer, the amino acid residue is in L-configuration.

4,001,200

NOVEL POLYMERIZED, CROSS-LINKED, STROMAL-FREE HEMOGLOBIN

Pieter Bonsen, Los Altos, Calif.; Myron B. Laver, Weston, Mass., and Kent C. Morris, Mountain View, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Feb. 27, 1975, Ser. No. 554,051
The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.
Int. Cl.² C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R **6 Claims**

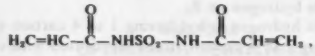
1. Polymerized, cross-linked, stromal-free hemoglobin, soluble in aqueous and physiological fluids, capable of reversibly binding a ligand, having a molecular weight of 64,000 to 1,000,000 and the formula poly(Hb)$_n$ wherein Hb is a member selected from the group consisting of a stromal-free monomer, dimer, trimer and tetramer hemoglobin, and *n* is 4 to 60.

4,001,201
PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS USING VINYL SUBSTITUTED, SO_2 CONTAINING, AMINE SALT

Rolf Kyburz, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 16, 1973, Ser. No. 333,247
Claims priority, application Switzerland, Feb. 25, 1972, 2722/72
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² C09H *7/00;* **C08F** *116/06*
U.S. Cl. 260—117 **5 Claims**

1. Process for crosslinking hydrophilic colloids which contain amino-, imino- and/or hydroxyl groups, which process comprises employing as crosslinking agent a compound of the formula



or a salt of such compound, formed with one equivalent of an amine.

4,001,202
PROCESS FOR MAKING SULFONATED LIGNIN SURFACTANTS

Peter Dilling, and Gerald Prazak, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,441
Int. Cl.² C07G *1/00*
U.S. Cl. 260—124 R **7 Claims**

1. In a process for modifying a sulfonated lignin to provide dye dispersant properties by reacting a sulfonated lignin with an epihalohydrin the improvement commprising,

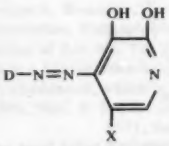
reacting an aqueous solution of a sulfonated lignin at a solids concentration between 5% and 35% with from 0.1 to 2.0 moles of an epihalohydrin per 1,000 grams of lignin at a temperature between 20° C. and 100° C. and a starting pH between 9 and 13 until the sulfonated lignin-epihalohydrin adduct has a viscosity below 500 cps. at 25° C.

4,001,203
HEAVY METAL COMPLEXES OF AZO DYESTUFFS CONTAINING A HETEROCYCLIC DIAZO COMPONENT AND THE RESIDUE OF 5-HALOGENO-2,3-DIHYDROZYPYRIDINE AS COUPLING COMPONENT

Gerhard Back, Loerrach, Germany, and Alfred Fasciati, Bottmingen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 140,283, May 4, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,516
Claims priority, application Switzerland, May 6, 1970, 6784/70
Int. Cl.² C09B *45/00*
U.S. Cl. 260—146 R **5 Claims**

1. The 1:1 and 1:2 cobalt, nickel, copper or chromium complex of a compound of the formula



wherein

X is chloro or bromo, and

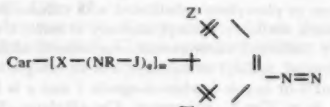
D is pyridinyl, quinolinyl benzthiazolyl, indazolyl, triazolyl, pyrazolyl, benztriazolyl, benzimidazolyl, thiazolyl, pyrazol-5-one-yl, thiadiazolyl, acrindinyl, carbazolyl or benzisothiazolyl, which is unsubstituted or substituted by chloro, bromo, nitro, cyano, lower alkyl, lower alkoxy, lower alkylsulfonyl, sulfo, carboxy, sulfamoyl, N-lower alkyl sulfamoyl, N-lower hydroxyalkyl sulfamoyl, formylamino, acetamido, benzoylamino, phenylsulfonamido, p-tolylsulfonamido, methylsulfonamido, carboxymethyoxyamino, carboethoxyamino, dimethylaminosulfonylamino, carboisopropoxyamino, phenyl, pyridyl, methylthio, ethylthio, phenylthio, cyclohexylthio, phenylsulfonyl, carbomethoxyethyl, phenylazo, naphthylazo, sulfophenylazo or a fiber reactive radical selected from the group consisting of chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, α,β-dichloropropionyl, α,β-dibromopropionyl, chloromaleyl, β-chloroacrylyl, β-bromoacrylyl, α-chloroacrylyl, α-bromoacrylyl, α,β-dichloroacrylyl, α,β-dibromoacrylyl, trichloroacrylyl and chlorocrotonyl; said fiber-reactive radical bonded via —NH— or aminosulfophenylazo.

4,001,204
MAGENTA IMAGE-PROVIDING PHENYLAZONAPHTHYL DYES CONTAINING A MORPHOLINYL OR PIPERIDINE RADICAL

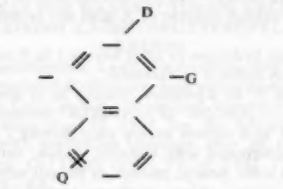
James J. Krutak, Sr., Kingsport, Tenn.; Jan R. Haase, and Richard A. Landholm, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 439,787, Feb. 5, 1974, Pat. No. 3,932,380. This application Nov. 3, 1975, Ser. No. 628,713
Int. Cl.² C09B *29/10*
U.S. Cl. 260—152 **11 Claims**

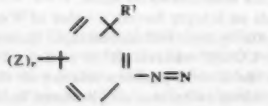
1. A magenta image dye-providing compound having a formula as follows:



I.

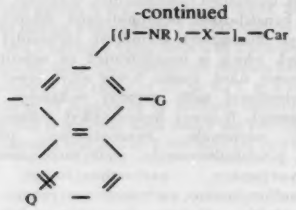


II.



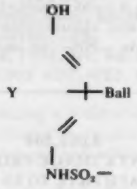
III.

-continued



wherein:

Car represents a carrier moiety which as a function of oxidation under alkaline conditions, releases a diffusible dye from said compound and having the formula



wherein

Ball represents an organic ballasting group containing at lease 8 carbon atoms which renders said compound non-diffusible in a photographic element during development in an alkaline processing composition;

Y represents the carbon atoms necessary to complete a benzene or naphthalene nucleus;

m and *q* each represent an integer having a value of 0 or 1;

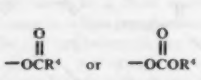
X represents a bivalent linking group of the formula —R-^{2}—L_n—$R^2{}_p$— where each R^2 can be the same or different and each represents alkylene having 1 to 8 carbon atoms; phenylene; or phenylene substituted with chloro, bromo, cyano, nitro, methoxy, methyl, carboxy or sulfo; L represents oxy, carbonyl, carboxamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl or sulfonyl; *n* is an integer having a value of 0 or 1; *p* is 1 when *n* equals 1 and *p* is 1 or 0 when *q* is o; Car-X- represents Car-alkylene—SO_2—, Car-$C_6H_4CH_2SO_2$—, or Car-phenylene—SO_2—, provided that the carbon content of X does not exceed 14 carbon atoms;

R represents hydrogen or alkyl having 1 to 6 carbon atoms;

J represents sulfonyl or carbonyl;

Q is in the 5- or 8-position relative to G and represents hydroxy, —$NHCOR^3$ or —$NHSO_2R^3$ wherein R^3 is alkyl having 1 to 6 carbon atoms, alkyl having 1 to 6 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxyl or sulfo; benzyl, phenyl, or phenyl substituted with carboxy, cyano, chloro, methoxy, methyl or sulfamoyl;

G represents hydroxy, an alkali metal salt thereof, a photographically inactive amine salt thereof, or a hydrolyzable acyloxy group having the formula:



wherein

R^4 is alkyl having 1 to 18 carbon atoms, phenyl or phenyl substituted with chloro or nitro;

r represents an integer having a value of 1 or 2;

Z represents cyano, trifluoromethyl, fluorosulfonyl, carboxy, —$COOR^4$ wherein R^4 is as described previously, nitro in the 2- or 3-position relative to the azo linkage, fluoro, chloro or bromo, alkylsulfonyl having 1 to 7 carbon atoms, alkylsulfonyl having 1 to 8 carbon atoms substituted with hydroxy, phenyl, cyano, sulfamoyl, carboxy or sulfo; phenylsulfonyl, phenylsulfonyl substituted with sulfamoyl, carboxy, fluorosulfonyl or methoxy; alkylcarbonyl having 2 to 5 carbon atoms, —$SO_2NR^5R^6$ wherein R^5 represents hydrogen, alkyl having 1 to 8 carbon atoms; R^6 represents hydrogen, alkyl having 1 to 6 carbon atoms, alkyl having 1 to 6 carbon atoms substituted with hydroxy, cyano, fluorosulfonyl, carboxy or sulfo; benzyl, phenyl, phenyl substituted with hydroxy, sulfonyl, sulfamoyl, carboxy or sulfo; alkylcarbonyl having 2 to 7 carbon atoms, phenylcarbonyl, alkylsulfonyl having 1 to 6 carbon atoms, alkylsulfonyl having 1 to 6 carbon atoms substituted with cyano or hydroxy; phenylsulfonyl or methoxyphenylsulfonyl; or R^5 and R^6 taken together with the nitrogen atom to which they are bonded represent morpholino or piperidino; or Z represents —$CON(R^5)_2$ wherein each R^5 can be the same or different and is as described previously;

Z^1 represents hydrogen or Z;

R^1 represents hydrogen, alkyl having 1 to 4 carbon atoms, alkyl having 1 to 4 carbon atoms substituted with cyano, hydroxy or methoxy; alkoxy having 1 to 4 carbon atoms, chloro, bromo or fluoro;

D represents cyano, sulfo, fluorosulfonyl, chloro, bromo, fluoro, —SO_2-phenyl or —SO_2-phenyl substituted with hydroxy, chloro, carboxy, sulfamoyl, methyl or methoxy; alkylsulfonyl having 1 to 8 carbon atoms, alkylsulfonyl having 1 to 8 carbon atoms substituted with chloro, fluoro, hydroxy, phenyl, cyano, phenylsulfonyl or phenylsulfonyl substituted with carboxy, fluorosulfonyl or methoxy; alkylsulfinyl having 1 to 8 carbon atoms or alkylsulfinyl having 1 to 8 carbon atoms substituted with cyano, phenyl, hydroxy or sulfamoyl; phenylsulfinyl or phenylsulfinyl substituted with sulfo or fluorosulfonyl; —$SO_2NR^5R^6$, or —$CON(R^5)_2$ wherein each R^5 and R^6 is as described previously for Z,

with the proviso that there be no more than one sulfo radical, no more than one carboxy radical, and at least one morpholino or piperidino radical present in said compound.

4,001,205

WATER-SOLUBLE, FIBER-REACTIVE PHENYLAZODIHYDROXY, METHYL, CYANOPYRIDINE DYESTUFFS

Arthur Buehler, Rheinfelden; Alfred Fasciati, Bottmingen, and Gerd Hoelzle, Liestal, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 200,210, Nov. 18, 1971, abandoned, which is a continuation of Ser. No. 840,036, July 8, 1969, abandoned. This application Nov. 1, 1973, Ser. No. 411,624

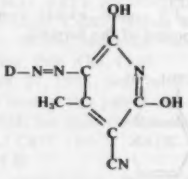
Claims priority, application Switzerland, July 15, 1968, 10521/68

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} C09B *62/08, 62/24, 62/50;* **D06P** *3/58*

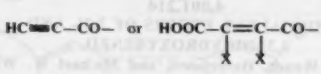
U.S. Cl. 260—156 **4 Claims**

1. A water soluble dyestuff of the formula



wherein D is phenyl which is substituted by at least one sulphonic acid group imparting solubility in water, and is additionally substituted by a fiber-reactive substituent attached to the diazo component via an -NH- group and selected from the

group consisting of acryloxy, α-bromoacryloyl, α-chloroacryloyl, chloro- or bromo- triazinyl, chloro- or bromo-pyrimidyl, chloro- or bromo-propionyl, α,β-dibromopropionyl, fluorocyclobutanecarbonyl, chloroquinoxalinecarbonyl, methanesulphonylpyrimidinyl and a group of the formula



in which one of the symbols X represents hydrogen and the other chlorine or bromine; and said phenyl is further unsubstituted or substituted by at least one member selected from the group consisting of hydroxy, cyano, 4-methyl-3-sulfophenylsulfonyl, sulphamide, nitro, chloro, methoxy and acetylamino.

4,001,206

OPTIONALLY SUBSTITUTED BENZOTHIAZOLYLPHENYL-AZO-ALKANOYLACETAMIDONAPHTHALENES

Georg Schoefberger, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

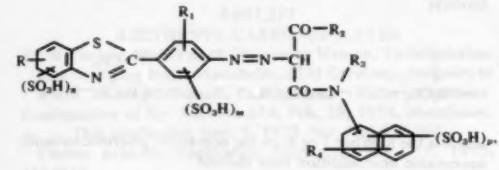
Filed Feb. 11, 1972, Ser. No. 225,629

Claims priority, application Switzerland, Feb. 16, 1971, 2250/71

Int. Cl.² C09B *29/32*; D06P *1/06*; D21H *3/80*

U.S. Cl. 260—158 **19 Claims**

1. A compound of the formula



or a water-soluble salt thereof,

where in

R is hydrogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

R_2 is alkyl of 1 to 6 carbon atoms,

R_3 is hydrogen or alkyl of 1 to 6 carbon atoms,

R_4 is hydrogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

m is 0 or 1,

n is 0 or 1,

p is 0 to 3,

with the proviso that the sum of *m*, *n* and *p* is 1 to 5.

4,001,207

TERTIARY-ALIPHATIC AMIDAZO COMPOUNDS

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Kenmore, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation-in-part of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application June 1, 1971, Ser. No. 148,885

Int. Cl.² C07C *107/02*, *109/06*

U.S. Cl. 260—192 **2 Claims**

1. t-Butylazo-N-carboxymethl-formamide.

2. T-cumylazoformamide.

4,001,208

1-N-[(S)-α-HYDROXY-ω-AMINOACYL]

Hamao Umezawa; Sumio Umezawa; Kenji Maeda, all of Tokyo; Osamu Tsuchiya; Shinichi Kondo, both of Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyo Kai, Tokyo, Japan

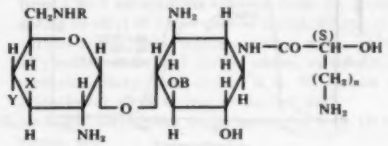
Filed Oct. 1, 1973, Ser. No. 402,085

Claims priority, application Japan, Oct. 6, 1972, 47-99866; Oct. 19, 1972, 47-103988; Dec. 11, 1972, 47-123482; Jan. 23, 1973, 48-9146

Int. Cl.² C07C *128/18*

U.S. Cl. 536—17 **9 Claims**

1. A compound of the formula:



wherein R is hydrogen or alkyl of 1–4 carbon atoms; B is hydrogen or β-D-ribofuranosyl; at least one of X and Y is hydrogen and the other of X and Y is hydrogen or hydroxyl; *n* is 2 or 3; and the pharmaceutically acceptable acid addition salts thereof.

4,001,209

ANTIBIOTIC G-52 AND METHOD FOR THE PRODUCTION THEREOF

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 271,838, July 14, 1972, abandoned. This application Feb. 28, 1975, Ser. No. 554,291

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **5 Claims**

1. A composition of matter selected from the group consisting of Antibiotic G-52, non-toxic acid addition salts and Schiff base-oxazolidine derivatives thereof.

4,001,210

PROCESS FOR MANUFACTURING CELLULOSE CONTAINING 2,3-DIHYDROXYPROPYL ETHER GROUPS

Konrad Engelskirchen, Lank, Niederrhein, and Joachim Galinke, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Mar. 17, 1975, Ser. No. 558,632

Claims priority, application Germany, Mar. 29, 1974, 2415155

Int. Cl.² C08B *11/08*, *11/20*; C08L *1/26*

U.S. Cl. 536—84 **10 Claims**

8. A 2,3-dihydroxypropyl ether of cellulose containing 1% to 10% by weight of borate ions.

4,001,211

PHARMACEUTICAL CAPSULES FROM IMPROVED THERMOGELLING METHYL CELLULOSE ETHERS

Nitis Sarkar, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

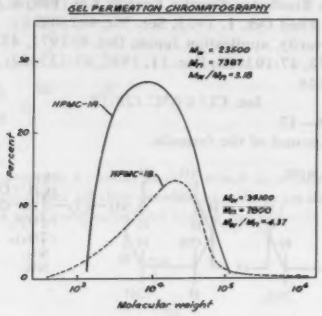
Continuation-in-part of Ser. No. 528,830, Dec. 2, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,549

Int. Cl.² B29C *13/00*; C08B *11/08*, *11/193*

U.S. Cl. 536—84 **10 Claims**

1. A thermal gelling methyl cellulose ether composition suitable for use in preparing pharmaceutical capsules by an aqueous dip coating process using preheated pins and having a methoxyl DS of about 1.5–2.0, a C_2–C_3 hydroxyalkyl MS of about 0.1–0.4, a 2 wt. % aqueous solution viscosity of about

2–10 cps at 20° C and a thermal gel point of about 50°–80° C, and a 15–30 wt. % aqueous solution viscosity of about 1,000–10,000 cps at 20° C, said composition being further characterized by having as a 15–30 wt. % aqueous solution:



A. Essentially Newtonian fluid properties as defined by a power law coefficient, n, of 0.9–1.0 at shear rates of between 0.1–10 sec^{-1}, and

B. A 50 sec gel yield strength of at least 150 dynes/cm^2 at 65° C.

4,001,212

MACROCYCLIC POLYAMINES

Jack E. Richman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

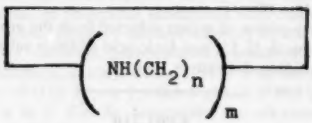
Filed Oct. 3, 1973, Ser. No. 403,326

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07D *259/00*

U.S. Cl. 260—239 BC **7 Claims**

1. A compound having the formula



where m is an integer of 3–7, and each n, independently, is an integer of 2–5, with the provisos that

when m is 3 and two of the n values are 2 or 3, then the third n is 4 or 5, and when m is 4 and one n is 2, then the remaining values of n are 3, 4 or 5.

4,001,213

REPRESSION OF POLYMER FORMATION IN THE CONVERSION OF LINEAR OR BRANCHED PRIMARY DIAMINES TO CYCLIC IMINES

Arnold Hershman, St. Louis, Mo., and Anthony J. C. Pearson, Highton, Australia, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 26,131, April 6, 1970, abandoned. This application May 17, 1974, Ser. No. 470,900

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07D *207/06, 211/02, 223/04, 295/02*

U.S. Cl. 260—239 B **16 Claims**

1. Process for the conversion of linear or branched primary alkyl diamines to saturated cyclic secondary amines, the said diamines having a carbon chain of 3 to 7 carbon atoms between amine groups, with the repression of the formation of linear or branched secondary amines, tertiary amines and polymers, which comprises passing the said diamines in the vapor phase, in the absence of added ammonia, at a temperature of from 100°C to 250°C over a solid catalyst comprising an element selected from the group consisting of nickel, copper, cobalt or iron.

4,001,214

AMINOALKYL ETHERS OF 2,2′- AND 3,3′-DIHYDROXYBENZIL

Gerhard R. Wendt, Havertown, and Michael W. Winkley, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

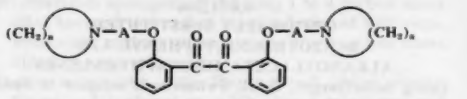
Filed Oct. 30, 1975, Ser. No. 627,486

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

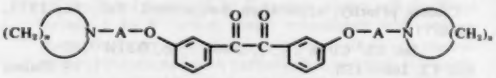
Int. Cl.² C07D *295/08*

U.S. Cl. 260—239 B **3 Claims**

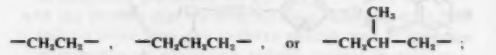
1. A symmetrical compound of the formula:



or



wherein A is a divalent aliphatic hydrocarbon radical of the formula



and n is the number 7 or 8; or the non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,001,215

1,2,5,8-TETRA HYDRO-2,4,6,8-TETRAMETHYL-1,5-DIAZOCINE-2,8-DIOL AND METHOD OF PREPARATION

Thomas J. Dietsche, Berkeley, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 12, 1976, Ser. No. 666,512

Int. Cl.² C07D *245/02*

U.S. Cl. 260—239 BC **7 Claims**

1. 1,2,5,8-Tetrahydro-2,4,6,8-tetramethyl-1,5-diazocine-2,8-diol.

2. The process of preparing the compound of claim 1 which comprises the step of reacting 2,4-pentanedione with ammonia by contacting said dione with the ammonia as components of a solution in a C_1 to C_3 alcohol, at a temperature such that said solution is a liquid, but below about 125° C.

4,001,216

AMINOALKYL ETHERS OF 2,2′- AND 3,3′-DIHYDROXYDESOXYBENZOIN

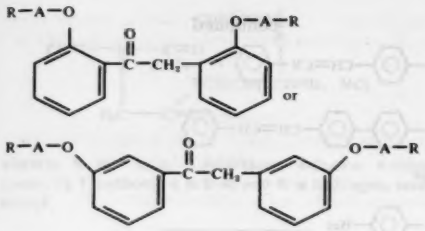
Michael W. Winkley, Malvern, and Gerhard R. Wendt, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,487

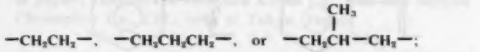
Int. Cl.² C07D *295/08*

U.S. Cl. 260—239 B **2 Claims**

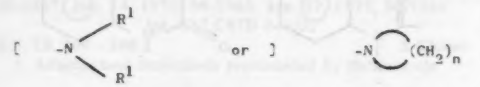
1. A compound of the formula



wherein A is a divalent aliphatic hydrocarbon radical of the formula



and R is identically a substituted amino group of the formula



wherein *n* is the number 4, 5, 6, 7, or 8; and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,001,217

AZETIDINYL CARBOTHIOLATES

Adolf Fischer, Mutterstadt; Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 446,674, Feb. 28, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,064

Claims priority, application Germany, Mar. 10, 1973, 2312045

Int. Cl.² C07D *205/04*

U.S. Cl. 260—239 A **1 Claim**

1. S-trichloroallyl-(2,2,4-trimethylazetidine)-1-carbothiolate.

4,001,218

PENICILLINS

Günter Schmidt, and Karl Georg Metzger, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 419,950, Nov. 29, 1973. This application Feb. 5, 1975, Ser. No. 547,208

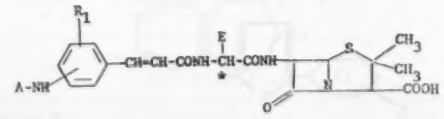
Claims priority, application Germany, Dec. 8, 1972, 2260118

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *499/68, 499/70*

U.S. Cl. 260—239.1 **16 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

the carbon atom designated by * is asymmetrically substituted;

R_1 is hydrogen, halo, lower alkyl, hydroxy, nitro or A—NH—;

A is R_3CO- or R_4CS- in which

R_3 is hydrogen; lower alkyl; halo(lower alkyl); cycloalkyl of 3 to 11 carbon atoms unsubstituted or substituted by hydroxy or alkyl of 1 or 2 carbon atoms; cycloalkenyl of 3 to 11 carbon atoms; bicycloalkyl of up to 8 carbon atoms; bicycloalkenyl of up to 8 carbon atoms; aryl of 6 to 10 carbon atoms, unsubstituted or substituted by from 1 to 3 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, nitro, amino and alkylsulfonyl of 1 to 4 carbon atoms, or substituted by methylenedioxy; azidoaryl of 6 to 10 carbon atoms; azido(lower alkyl; amino; or thienyl; and

R_4 is lower alkylamino or arylamino of 6 to 10 carbon atoms; and

E is phenyl; phenyl substituted by hydroxy, azido, lower alkyl, lower alkoxy, lower alkylthio or chloro; or thienyl.

4,001,219

STEROIDAL DERIVATIVES OF BENDAZOLIC ACID AND PROCESS FOR THE PREPARATION OF THE SAME

Leandro Baiocchi, via Platina, 22 Rome, Italy

Filed Jan. 9, 1976, Ser. No. 647,749

Claims priority, application Italy, Feb. 13, 1975, 48150/75

Int. Cl.² C07J *5/00*

U.S. Cl. 260—239.5 **2 Claims**

1. Esters of [(1-benzyl-1H-indazol-3-yl)-oxy]-acetic acid at primary hydroxyl in position 21 of hydrocortisone, cortisone, prednisone and prednisolone.

4,001,220

6-(AMINATED METHYL)-3β-OXY-5α-(CHOLESTANE-STIGMASTANE)-5,6-DIOLS, SALTS THEREOF, AND INTERMEDIATES THERETO

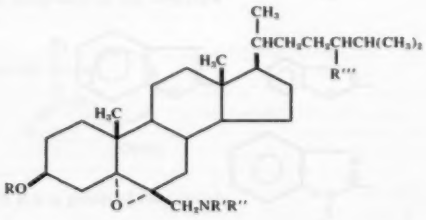
Leonard N. Nysted, Highland Park, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 27, 1976, Ser. No. 652,944

Int. Cl.² C07J *21/00*

U.S. Cl. 260—239.55 R **17 Claims**

12. A compound of the formula



wherein R represents hydrogen or acetyl; R′ and R″ each represent hydrogen, alkyl containing fewer than 8 carbons, or hydroxyalkyl of the formula

—Alk—OH

in which Alk represent alkylene containing more than 1 and fewer than 6 carbons; and R''' represents hydrogen or ethyl.

4,001,221

4-STILBENYL-5-CYANO-1,2,3-TRIAZOLES

Dieter Günther; Hans Jürgen Nestler, both of Kelkheim, Taunus; Günter Rösch, Altenhain, Taunus, and Erich Schinzel, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

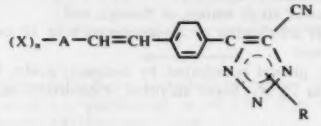
Filed Sept. 12, 1975, Ser. No. 612,700

Claims priority, application Switzerland, Sept. 13, 1974, 12469/74

Int. Cl.² C07D *249/04, 249/06, 413/04*

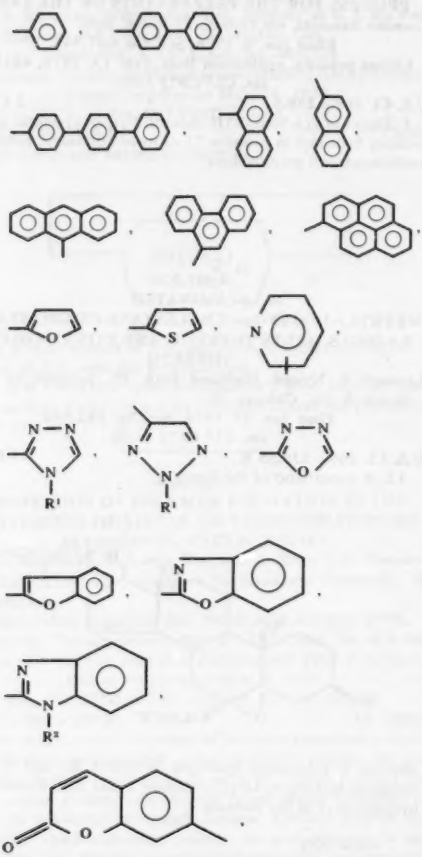
U.S. Cl. 260—240 C **9 Claims**

1. A compound of the formula

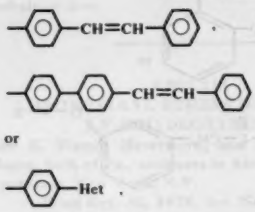


wherein R is hydrogen, or lower alkyl which may be substituted by phenyl, hydroxy, lower carbalkoxy or cyano

A is a group of the formula

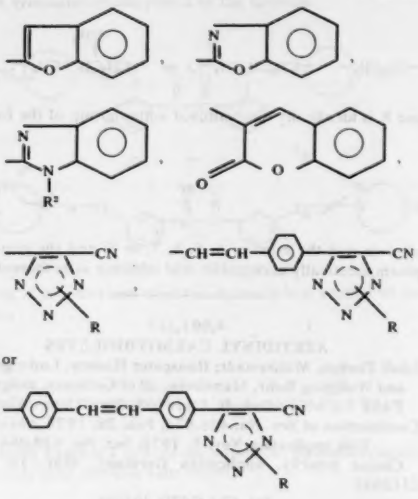


-continued



or

wherein Het has the following meaning:



X is hydrogen or identical or different non-chromo-phorous groups of the series of fluorine, chlorine or bromine atoms, lower alkyl, lower alkoxy, amino, lower mono- or di-alkyl amino, lower trialkyl ammonium or acyl amino groups, or carboxy or sulfo which may be functionally modified, and 2 adjacent radicals X may together also represent a lower alkylene or an 1,3-dioxypropylene group, *n* is an integer from 1 to 3,

R^1 is hydrogen, lower alkyl or phenyl, and R^2 is hydrogen or lower alkyl.

4,001,222

3-(AMINOACYL)-1-{[5-(SUBSTITUTED PHENYL)FURFURYLIDENE]AMINO}HYDANTOINS AND PROCESS FOR THE PREPARATION THEREOF

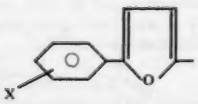
Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,262

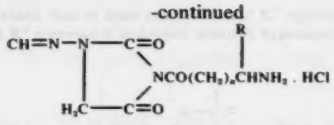
Int. Cl.² C07D *405/06*

U.S. Cl. 260—240 G **11 Claims**

1. A compound of the formula:



-continued



wherein X is 4-nitro, 3,4-dichloro, 4-fluoro, 4-chloro, 4-cyano, or 4-methoxy, *n* is 0–4; and R is hydrogen, methyl or benzyl.

4,001,223

ADAMANTANE-PIPERAZINE DERIVATIVES

Michio Sugimoto; Fumitada Yamamoto; Kosaku Honna; Konomu Kurisaki; Hirozo Sugahara; Kiyoshi Watanabe, all of Chiba; Yasuo Fujimoto, Tokyo, and Syoji Ryu, Noda, all of Japan, assignors to Idemitsu Kosan Co., Ltd. and Nippon Chemiphar Co., Ltd., both of Tokyo, Japan

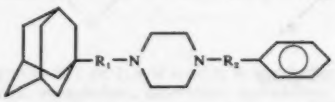
Filed Dec. 16, 1975, Ser. No. 641,232

Claims priority, application Japan, Jan. 13, 1975, 50-5567; Jan. 13, 1975, 50-5568; Jan. 13, 1975, 50-5569; Jan. 17, 1975, 50-7065; Jan. 16, 1975, 50-6468; Jan. 16, 1975, 50-6467; Jan. 14, 1975, 50-5903; Jan. 17, 1975, 50-7066

Int. Cl.² C07D *241/02*

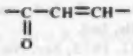
U.S. Cl. 260—240 J **5 Claims**

1. Adamantane derivatives represented by the formula



wherein R_1 is

or $-CH_2-$ and R_2 is



or $-CH_2-CH=CH-$.

4,001,224

4-SUBSTITUTED-2, 3-DIHYDRO-1-BENZOXEPIN-3, 5-DIONES AND TAUTOMERS

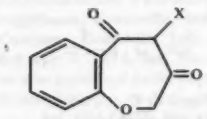
Sylvester Klutchko, Hackettstown, and Max von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 554,876, March 3, 1975. This application Mar. 18, 1976, Ser. No. 667,916

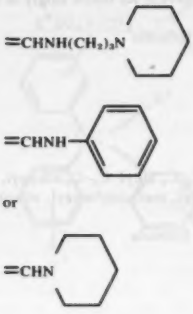
Int. Cl.² C07D *313/08, 405/12*

U.S. Cl. 260—240 R **4 Claims**

1. A compound of the formula:



wherein X is



and tautomers thereof.

4,001,225

PYRIDYL SUBSTITUTED 7-αESTERS OF 3 HETEROTHIO 7-ACETAMIDO CEPHALOSPORANIC ACIDS

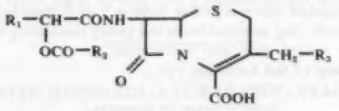
Hirokichi Harada, Nishinomiya, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 476,037, June 3, 1974. This application Jan. 30, 1975, Ser. No. 545,342

Int. Cl.² C07D *501/36*

U.S. Cl. 260—243 C **8 Claims**

1. A compound of the formula:



wherein

R_1 is phenyl or thienyl,

R_2 is pyridyl, and

R_3 is thiadiazolylthio or tetrazolylthio, either of which may be substituted with methyl,

and pharmaceutically acceptable salts thereof.

4,001,226

3-(SUBSTITUTED)CARBONYLAMINO CEPHEM DERIVATIVES

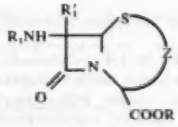
Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 4, 1974, Ser. No. 529,676

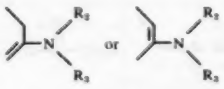
Int. Cl.² C07D *501/20, 501/60*

U.S. Cl. 260—243 C **30 Claims**

1. A compound of the formula



wherein Z is a group of the formula



wherein R_2 and R_3 are each hydrogen or taken together form the group =C=O, wherein R_2 taken singly is hydrogen and R_3 taken singly is

a. a group of the formula

wherein R_4 is C_1–C_6 alkyl, C_3–C_6 alkenyl, C_1–C_8 haloalkyl, 2,2,2-trihaloethyl, methoxybenzyl, nitrobenzyl, benzyl or phenyl; or

b. a group of the formula

wherein R_5 is C_1–C_6 alkyl, phenyl, or benzyl; or

c. a group of the formula

wherein R_6 is hydrogen, C_1–C_6 alkyl, benzyl, phenyl, or tolyl and R_8 is hydrogen, C_1–C_6 alkyl or benzyl; or wherein R_6 and R_8 and the nitrogen atom to which they are bonded taken together form a 5 or 6 membered heterocyclic ring selected from the group consisting of piperidine, morpholine, and pyrrolidine; or

d. a group of the formula

wherein R_7 is C_1–C_6 alkyl, di(C_1–C_3 alkoxycarbonyl)-methyl, benzyl or phenyl; and

wherein R is hydrogen or a carboxylic acid protecting ester forming group; R_1' is hydrogen; and wherein R_1 is an acyl group of the formula

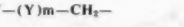
wherein R′ is

a. C_1–C_7 alkyl, C_3–C_7 alkenyl, cyanomethyl, halomethyl, 4-amino-4-carboxybutyl, 4-protected amino-4-protected carboxybutyl; or

b. C_1–C_6 alkoxy, benzyloxy, 4-nitrobenzyloxy or 4-methyoxybenzyloxy; or

c. the group —R″ wherein R″ is 1,4-cyclohexadienyl, phenyl, or substituted phenyl wherein the substituents are 1–3 halogens, hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, carboxy, caraboxymethyl, hydroxymethyl, aminomethyl, or protected aminomethyl; or

d. an arylalkyl group of the formula

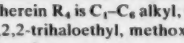


wherein R″ is as defined above,
X is O or S, and
m is 0 or 1; or

e. a substituted arylalkyl group of the formula

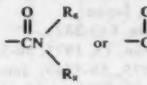
wherein R‴ is R″ as defined above, 2-thienyl, or 3-thienyl; W is hydroxy or protected hydroxy, carboxy or protected carboxy, amino, protected amino; or

f. a heteroarylmethyl group of the formula

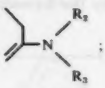


wherein R⁗ is 2-theinyl, 3-theinyl, 2-furyl, 3-furyl, 2thiazolyl, 5-tetrazolyl or 1-tetrazolyl;

and when R is hydrogen, the pharmaceutically acceptable non-toxic salts of the acids represented thereby; with the limitations that when R_3 is

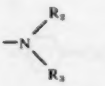


, Z can only be



;

and when the group



is —N=C=O, R cannot be hydrogen.

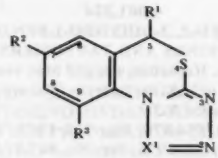
4,001,227

TETRAZOLO- AND TRIAZOLOBENZOTHIAZINES

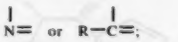
Barry A. Dreikorn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 22, 1975, Ser. No. 643,273
Int. Cl.² C07D *279/08*
U.S. Cl. 260—243 R **6 Claims**

1. A compound of the formula



wherein
X represents



R represents hydrogen or C_1–C_4 alkyl;
R^1 represents hydrogen or phenyl;
R^2 and R^3 independently represent hydrogen, C_1–C_3 alkyl, chloro or bromo;

provided that at least one of R^2 and R^3 represents hydrogen; that R^3 represents hydrogen when X represents

and R represents C_1–C_4 alkyl and that R^2 does not represent C_1–C_3 alkyl when X represents

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4,001,228

2-THIOL-4,5-DIPHENYLOXAZOLE S-DERIVATIVES

Gabriele Mattalia, Rome, Italy, assignor to Serono Laboratories, Inc., Boston, Mass.

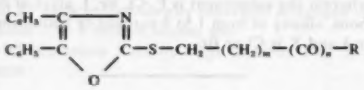
Filed July 23, 1975, Ser. No. 598,186

Claims priority, application United Kingdom, Aug. 6, 1974, 34673/74

Int. Cl.² C07D *263/46*

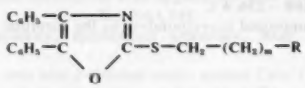
U.S. Cl. 260—247.1 M **6 Claims**

1. A compound of the formula



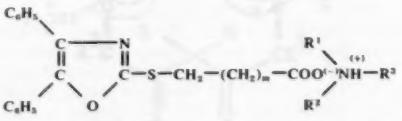
wherein *m* is 0, 1 or 2; *n* is 0 or 1; R is a hydroxy, amino, alkylamino, morpholino, piperidino, pyrrolidino, aminoalkoxy, or alkylaminoalkoxy radical, the alkyl chains in said radicals having 1–4 carbon atoms, and provided that R is not hydroxy when *n* is 1; and the pharmaceutically acceptable addition salts thereof.

5. 2-Oxyalkylthio-4,5-diphenyloxazole of the formula:



wherein *m* is 0, 1 or 2 and R is hydroxy or alkoxy of 1 to 4 carbon atoms.

6. An addition salt of S-(4,5-diphenyloxazol-2-yl)-mercaptocarboxylic acid of the formula:



wherein *m* is 0, 1 or 2 and R^1, R^2 and R^3 are each hydrogen or an alkyl or hydroxyalkyl having from 1 to 4 carbon atoms.

4,001,229

ALKANESULFONAMIDO TRIPHENYLETHYLENES

William E. Kreighbaum, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

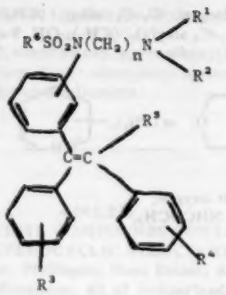
Filed Apr. 4, 1974, Ser. No. 457,931

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07D *295/14*

U.S. Cl. 260—247.1 R **12 Claims**

1. A compound selected from the group consisting of bases having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein

R^1 and R^2 are lower alkyl having 1 to 4 carbon atoms, or together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of morpholine, thiamorpholine, aziridine, pyrrolidine, piperidine, hexahydroazepine, and octahydroazocine,

R^3 and R^4 are selected from the group consisting of hydrogen, hydroxy and methoxy,

R^5 is selected from the group consisting of hydrogen, chlorine, bromine, iodine, nitro, alkyl having 1 to 4 carbon atoms and perfluoroalkyl having 1 to 4 carbon atoms,

R^6 is lower alkyl having 1 to 4 carbon atoms, and

n is the integer 2 or 3.

4,001,230

3-(5-NITROIMIDAZOL-2-YL)PYRAZOLO[3,4-d]PYRIMIDINE COMPOUNDS

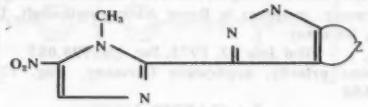
Henry Friedman, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 469,256, May 13, 1974, abandoned. This application Jan. 31, 1975, Ser. No. 545,852

Int. Cl.² C07D *487/04*

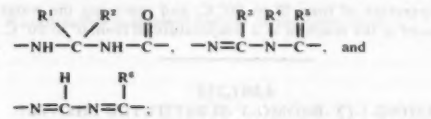
U.S. Cl. 260—247.5 DP **13 Claims**

1. A pyrazolo[3,4-d]-pyrimidine compound of the formula



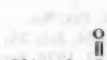
wherein

Z is selected from the group consisting of



R is C_1–C_3 alkyl, hydroxy(C_1–C_3)alkyl, or halo(C_1–C_3)alkyl;

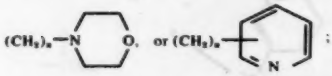
R^1 is $-CH_2X$;



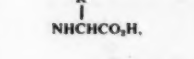
X is bromine, chlorine, fluorine, or iodine;

R^3 is hydrogen, C_1–C_4 alkyl, or CF_3;

R^4 is hydrogen, C_1–C_4 alkyl, $(CH_2)_nN(C_1$–C_4 alkyl)$_2$, $CH_2CH[O(C_1$–C_4 alkyl)$]_2$, $(CH_2)_n$-OH, 9-octadecenyl,



R^5 is NH or oxygen;
R^6 is NH_2, $NHCOCH_3$,



R^7 is hydrogen or $-CH_2CH_2SCH_3$;
n is 1, 2, 3, or 4;
and the nontoxic, pharmacologically-acceptable salts thereof.

4,001,231

PROCESS FOR MAKING A METHENAMINE SALT OF AN OPTICALLY ACTIVE ACID

Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed Mar. 29, 1973, Ser. No. 332,442
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² C07D *251/04*
U.S. Cl. 260—248.5 **1 Claim**

1. The process for making a salt of methenamine which comprises slowly adding d-mandelic acid to a boiling, stirred suspension of methenamine in a solvent selected from the group consisting of ethyl methyl ketone, acetone, ethanol and isopropanol, in the molar ratio of 0.8:1.0 to 1.0:0.8, removing the heat but continuing the stirring until the mixture cools to room temperature, cooling in an ice-water bath and recovering the formed crystals of methenamine dextro-mandelate.

4,001,232

PROCESS FOR PREPARING 1-SUBSTITUTED 2-METHYL-TETRAHYDROPYRIMIDINES

Gerhard Groegler, Leverkusen; Gerhard Dankert; Klaus Recker, both of Cologne, and Josef Backes, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 22, 1975, Ser. No. 598,083
Claims priority, application Germany, Aug. 17, 1974, 2439550
Int. Cl.² C07D *239/06*
U.S. Cl. 260—251 R **7 Claims**

1. Process for preparing 1-substituted, 2-methyltetrahydropyrimidine which comprises reacting an N-substituted propylene diamine with an acetoacetic acid ester or amide at a temperature of from 0° to 80° C, and removing the water produced in the reaction at a temperature of from 0° to 80° C.

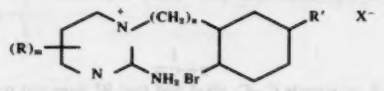
4,001,233

2-AMINO-1-(2′-BROMO-3′-SUBSTITUTED PHENYL) PYRIDINIUM COMPOUNDS

Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 532,796, Dec. 16, 1974, Pat. No. 3,957,787, which is a division of Ser. No. 382,804, July 26, 1973, Pat. No. 3,868,374. This application Jan. 22, 1976, Ser. No. 651,390
Int. Cl.² C07D *239/42*
U.S. Cl. 260—256.4 N **4 Claims**

1. A compound of the formula



wherein m is 1 or 2; when m is 1, R occupies either the 4- or 5-positions of the starting 2-aminopyrimidine, but when R is halogen it occupies only position-5; when m is 2, the two R-substituents occupy the 4- and 5-positions of the starting 2-aminopyrimidine, but only one of the two R-substituents can be halogen and it must occupy the 5-position;

R is the same or different and is hydrogen, F, Cl, Br, alkyl of from 1 to 4 carbons, benzyl, phenyl, or mono-substituted phenyl wherein the substituent is F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, or trifluoromethyl; provided that when R is halogen, and m is 1, R occupies only the 5-position in the starting 2-aminopyrimidine;

R′ is hydrogen, F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkylthio of from 1 to 4 carbons, alkylsulfonyl wherein the alkyl radical has from 1 to 4 carbons, phenyl, phenyloxy, sulfamoyl, dialkylamidosulfonyl wherein each alkyl radical has from 1 to 4 carbons, trifluoromethyl, mono-substituted phenyl or mono-substituted phenyloxy wherein the substituent is F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons or trifluoromethyl; n is 2 or 3 and X is Cl or Br.

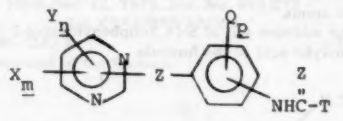
4,001,234

SUBSTITUTED PYRIMIDINYLOXY(THIO)PHENYL UREAS AND DERIVATIVES THEREOF

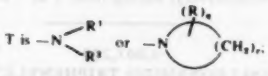
Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1974, Ser. No. 435,617
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² C07D *239/34*
U.S. Cl. 260—256.4 C **16 Claims**

1. A compound corresponding to the formula:

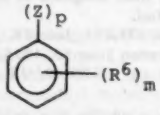


wherein:



r represents an integer of 4 or 5;
q represents an integer of 0 to 2, inclusive;
p represents an integer of 0 or 1;
each X independently represents bromo, chloro, iodo or fluoro;
m represents an integer of 0 to 3, inclusive;
each Y independently represents cyano, nitro, ZR^3, $-C(X')_3$ or

n represents an integer of 0 to 2, inclusive, the sum of *m* + *n* being from 0 to 3, inclusive;
each Z independently represents oxygen or sulfur;
Q represents methyl, ethyl, halo, nitro, cyano or trifluoromethyl;
each X' independently represents hydrogen or halo;
each R independently represents hydrogen or alkyl of from 1 to 3 carbon atoms;
R^1 represents hydrogen, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms;
R^2 represents alkyl of from 1 to 3 carbon atoms or



R^3 represents alkyl of from 1 to 3 carbon atoms;
R^4 and R^5 each independently represent hydrogen or alkyl of from 1 to 4 carbon atoms; and
each R^6 represents halo or alkyl of from 1 to 3 carbon atoms.

4,001,235

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 455,304, March 27, 1974, Pat. No. 3,857,849, which is a division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Sept. 5, 1974, Ser. No. 503,345

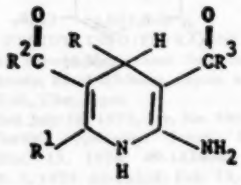
Claims priority, application Germany, Mar. 6, 1972, 2210674

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *239/26*

U.S. Cl. 260—256.4 Q **5 Claims**

1. A compound of the formula:



wherein
R is quinolyl, isoquinolyl, or pyrimidyl unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;
R^1, when taken independently, is hydrogen, lower alkyl, phenyl or pyridyl;
R^2, when taken independently, is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)-amino,
R^1 and R^2 when taken together are alkylene of 2 to 4 carbon atoms; and
R^3 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino.

4,001,236

POLYGLYCIDYL COMPOUNDS CONTAINING N-HETEROCYCLIC STRUCTURE

Jürgen Habermeier, Pfeffingen; Hans Batzer, Ariesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

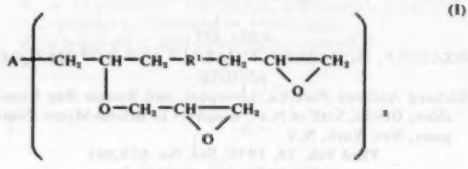
Division of Ser. No. 371,449, June 13, 1973, Pat. No. 3,900,493. This application June 19, 1975, Ser. No. 588,528

Claims priority, application Switzerland, June 23, 1972, 9528/72

Int. Cl.² C07D *49/32, 51/20, 51/30*

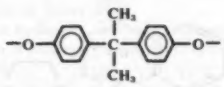
U.S. Cl. 260—256.4 F **5 Claims**

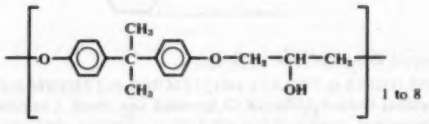
1. A polyglycidyl compound of the formula I



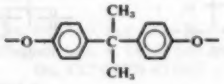
(I)

wherein A denotes one of the radicals of the formulae

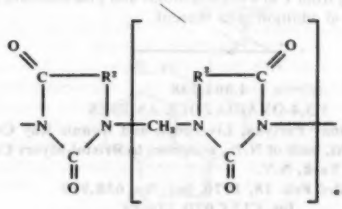




1 to 8

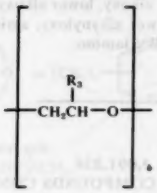


R^1 represents a divalent radical of the formula II



(II)

-continued

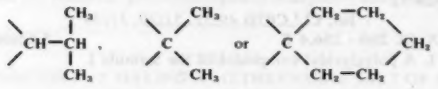


wherein

a and b are identical or different and denote either 0 or 1;

R^3 is hydrogen or methyl;

and R^2 denotes one of the radicals



4,001,237

OXAZOLE, ISOXAZOLE, THIAZOLE AND ISOTHIAZOLE AMIDES

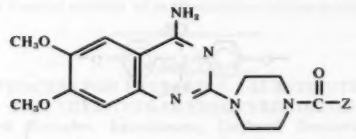
Richard Anthony Partyka, Liverpool, and Ronnie Ray Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 18, 1976, Ser. No. 658,961

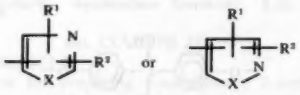
Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 B **12 Claims**

1. A compound having the formula:



wherein Z is either the radical



in which X is either oxygen or sulfur and R^1 and R^2 may be the same or different and are selected from the group consisting of hydrogen, (lower)alkyl having from 1 to 6 carbon atoms, (lower)alkoxy having from 1 to 6 carbon atoms and (lower)alkylthio having from 1 to 6 carbon atoms and pharmaceutically acceptable acid addition salts thereof.

4,001,238

1,3,4-OXADIAZOLE AMIDES

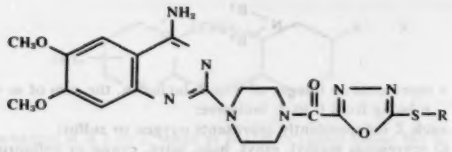
Richard Anthony Partyka, Liverpool, and Ronnie Ray Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 18, 1976, Ser. No. 658,979

Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 B **3 Claims**

1. A compound having the formula:



in which R is (lower)alkyl of 1 to 6 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

4,001,239

CEPHALOSPORIN CLEAVAGE PROCESS

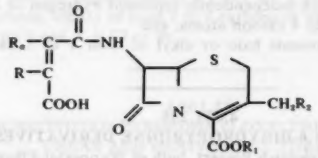
Stjepan P. Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 371,011, June 18, 1973, Pat. No. 3,905,966. This application June 13, 1975, Ser. No. 586,689

Int. Cl.² C07D *501/18*

U.S. Cl. 260—243 C **11 Claims**

1. A process for cleaving the amic acid function of a 7-(amic acid) cephalosporin having the formula

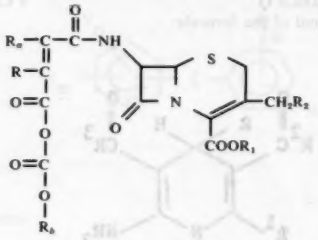


in which R and R_a are hydrogen, or R and R_a taken together with the carbon atoms to which they are attached represent orthophenylene;

R_1 is a carboxy protecting group; and

R_2 is hydrogen, acetoxy, methoxy, methylthio, (5-methyl-1,3,4-thiadiazol-2-yl)thio, or (1-methyl-1H-tetrazol-5-yl)thio; which comprises

1. contacting said 7-(amic acid) cephalosporin with an alkyl chloroformate in the presence of a tertiary amine to form the corresponding mixed anhydride having the formula



in which R_b is an alkyl group having from 1 to 4 carbon atoms;

2. contacting the product mixture from step (1) with a hydrazine of the formula

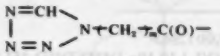
R_3HNNHR_4

in which R_3 and R_4 independently are hydrogen or methyl; and

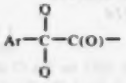
3. contacting the reaction mixture from step (2) with an acyl halide to produce the corresponding 7-acylamido cephalosporin, said acyl halide having the formula

R_x-Y

in which Y is halogen and R_Y is C_1 to C_8-alkanoyl; C_2 to C_8-chloro- or bromoalkanoyl; azidoacetyl; cyanoacetyl; 2-sydnone-3-C_1 to C_3-alkanoyl;

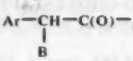


in which *m* is zero, 1, or 2;

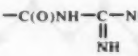


in which each Q is hydrogen or methyl, and Ar is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl, 3-pyrrolyl, phenyl, or phenyl substituted with chlorine, bromine, iodine, fluorine, trifluoromethyl, hydroxy, C_1 to C_3-alkyl, C_1 to C_3-alkyloxy, cyano, or nitro;

Ar—X—CH_2—C(O)— in which X is oxygen or sulfur, and Ar is as defined above; or Ar is 4-pyridyl and X is sulfur; or



in which Ar is as defined above, and B is -NH_2; an amino group protected with benzyloxycarbonyl, C_1 to C_4-alkoxycarbonyl, cyclopentyloxycarbonyl, cyclohexyloxycarbonyl, benzhydryloxycarbonyl, triphenylmethyl, 2,2,2-trichloroethoxycarbonyl,



or the enamine from methyl acetoacetate or acetylacetone; —OH, or —OH protected by esterification with a C_1 to C_6-alkanoic acid; —COOH, or —COOH protected by esterification with a C_1 to C_6-alkanol; —N_3; —CH; or —C(O)NH_2.

4,001,240

HEXAKIS(2-PYRIDYLTHIO)TETRAZINC MONOOXIDE

Mitsuo Masaki; Satoshi Matsunami; Susumu Fuzimura, and Kiyomi Okimoto, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

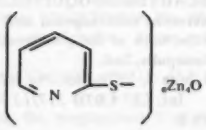
Filed July 16, 1975, Ser. No. 596,264

Claims priority, application Japan, Dec. 4, 1974, 49-138494; Dec. 13, 1974, 49-142466; Feb. 3, 1975, 50-13317; Feb. 3, 1975, 50-13318; Feb. 13, 1975, 50-17410

Int. Cl. C07d *213/70*

U.S. Cl. 260—270 K **4 Claims**

1. Hexakis(2-pyridylthio)tetrazinc monooxide having the formula



4,001,241

2-ALKOXY(AND 2-ALKOXYALKYL)-2-QUINOLYL-THIOACETAMIDES

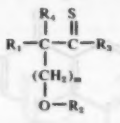
Helene E. Bowman Van Hoeven, Wallingford; L. Martin Brenner, Upper Darby, and Bernard Loev, Broomall, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 386,898, Aug. 9, 1973, Pat. No. 3,907,814, which is a continuation-in-part of Ser. No. 284,375, Aug. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 248,512, April 28, 1972, abandoned. This application June 12, 1975, Ser. No. 586,483

Int. Cl.² C07D *215/14*

U.S. Cl. 260—283 S **6 Claims**

1. A compound of the formula:



in which:

m is 0, 1 or 2;

R_1 is [2-pyrimidyl, 4-pyrmidyl, 2-pyrazinyl, 2-pyrrolyl,] 2-quinolyl [, 2-thiazolyl or 4-thiazolyl];

R_2 is lower alkyl, allyl or cyclopropanemethyl;

R_3 is

NH-phenyl or NH-$(CH_2)_n$-cycloalkyl, said cycloalkyl having 3–6 carbon atoms;

R_4 is hydrogen or lower alkyl;

R_5 and R_6 are hydrogen or lower alkyl and

n is 0 or 1 or a pharmaceutically acceptable acid addition salt thereof.

4,001,242

D-6-METHYL-8-FORMYL-10α-ALKOXY-8-ERGOLENE

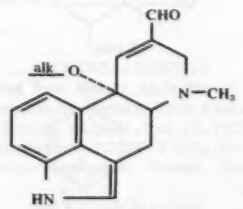
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 494,149, Aug. 2, 1974, Pat. No. 3,923,812. This application Aug. 4, 1975, Ser. No. 601,740

Int. Cl.² C07D *457/02*

U.S. Cl. 260—285.5 **1 Claim**

1. D-6-methyl-8-formyl-10α-alkoxy-8-ergolene of the formula



wherein alk is (C_1–C_3) alkyl.

4,001,243

SUBSTITUTED BENZO(IJ)QUINOLIZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

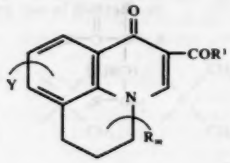
Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,149

The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.

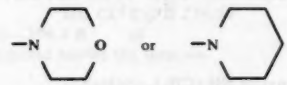
Int. Cl.² C07D *471/06*

U.S. Cl. 260—287 P **1 Claim**

1. A compound having the formula



wherein R is methyl, ethyl or trifluoromethyl; Y is methylenedioxy or ethylenedioxy bonded to adjacent ring positions; m is zero, one or two, and when R is trifluoromethyl, m is one; and R^1 is -OH, $-OR^2$ where R^2 is alkyl having 1 to 4 carbon atoms, halide, -OM where M is a pharmaceutically acceptable cation, NHR^3 where R^3 is alkyl having 1 to 4 carbon atoms,



4,001,244

1-ARYL-3,4-DIHYDRO-2(1H)-ISOQUINOLINE CARBONYL CHLORIDES

Peter K. Yonan, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 381,505, July 23, 1973, Pat. No. 3,905,982. This application Apr. 25, 1975, Ser. No. 571,638

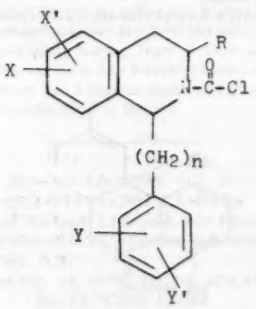
Claims priority, application Greece, July 18, 1974, 4872

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C07D *217/06*

U.S. Cl. 260—287 D **10 Claims**

1. A compound of the formula



wherein X and X′ are each selected from the group consisting of hydrogen, lower alkoxy, benzyloxy, and methyl, or X and X′ together represent a single methylenedioxy or ethylenedioxy group; Y and Y′ are each selected from the group consisting of hydrogen, halogen, lower alkoxy, and methyl; *n* is selected from the group consisting of 0 and 1; and R is selected from the group consisting of hydrogen and methyl.

4,001,245

2-[2-(PIPERIDINO)ETHYL]-10,10a-DIHYDRO-1H,5H-IMIDAZO[1,5-b]ISOQUINOLIN-1,3(2H)-DIONE

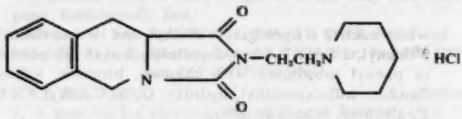
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,913

Int. Cl.² C07D *471/14*

U.S. Cl. 260—287 CF **1 Claim**

1. A compound of the formula:



4,001,246

DERIVATIVES OF 24-METHYLENE-14A-AZA-D-HOMO-CHOLESTADIENES

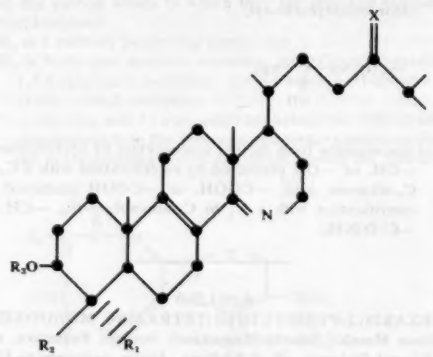
Charles D. Jones, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 503,561, Sept. 6, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,584

Int. Cl.² C07D *215/16, 215/38*

U.S. Cl. 260—288 CF **6 Claims**

1. The compound of the formula



wherein:

R_1 and R_2 are both hydrogen or both methyl;

R_3 is hydrogen; and

X is oxygen or NOR_4, wherein R_4 is hydrogen or C_1–C_4 alkyl,;

and the pharmaceutically acceptable salts thereof.

4,001,247

1-ETHYL 3A-(SUBSTITUTED-PHENYL) DECAHYDROISOQUINOLINE

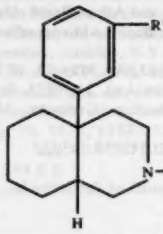
Dennis M. Zimmerman, Indianapolis, and Winston S. Marshall, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 7, 1974, Ser. No. 477,220

Int. Cl.² C07D *217/12*

U.S. Cl. 260—289 D **6 Claims**

1. A compound of the formula



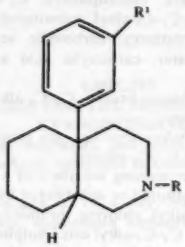
wherein
R¹ is O-alk or OH; and
alk is (C_1–C_3) alkyl.

4,001,248
N-CYCLOALKYLMETHYL DECAHYDROISOQUINOLINES

Dennis M. Zimmerman, Indianapolis, and Winston S. Marshall, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 7, 1974, Ser. No. 477,222
Int. Cl.² C07D 217/04
U.S. Cl. 260—289 D **9 Claims**

1. A compound of the formula:



wherein
R is cyclopropylmethyl or cyclobutylmethyl;
R′ is O-alk, OH, or

and
alk is (C_1–C_3) alkyl and pharmaceutically-acceptable acid-addition salts thereof

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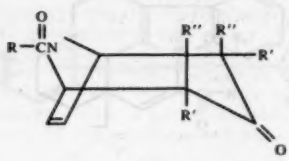
4,001,249
PROCESS FOR THE PREPARATION OF TROPANE ALKALOIDS

Ryoji Noyori, Nagoya; Yoshihiro Hayakawa, Ichinomiya; Yutaka Baba, Bisai, and Shinji Makino, Hazu, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co. Ltd., Nagoya, Japan

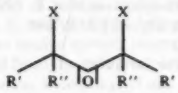
Filed Aug. 12, 1974, Ser. No. 496,579
Claims priority, application Japan, Oct. 15, 1973, 48-115424
Int. Cl.² C07D 451/12, 451/10
U.S. Cl. 260—292 **19 Claims**

1. A process for the preparation N-acyldehydronortropinone having the formula:



, wherein R represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, phenyl and phenoxy, and R′ and R″ each represents the same or different member selected from the group consisting of hydrogen lower alkyl, and halogen, comprising reacting an N-acylpyrrole having the formula:

, wherein R has the meaning given above, with an α, α′-halogenoketone having the formula:



, wherein R′ and R″ respectively have the meanings given to them above and X represents halogen, in the presence of a reducing agent selected from the group consisting of iron carbonyl and zinc-copper couple.

4,001,250
PROCESS FOR PREPARING 4-AMINO-2,2,6,6-TETRAMETHYL PIPERIDINE

Reinhard Lantzsch, and Dieter Arlt, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 24, 1975, Ser. No. 552,508
Claims priority, application Germany, Mar. 16, 1974, 2412750
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² C07D 211/58
U.S. Cl. 260—293.52 **9 Claims**

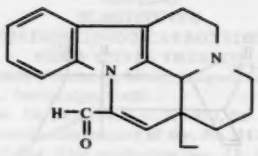
1. Process for preparing 4-amino-2,2,6,6-tetramethyl piperidine which comprises reacting phorone with ammonia and hydrogen in the presence of a hydrogenation catalyst.

4,001,251
APOVINCALDEHYDE

Henry Najer, and Yves Robert Alain Pascal, both of Paris, France, assignors to Synthelabo, Paris, France

Division of Ser. No. 423,901, Dec. 12, 1973, Pat. No. 3,925,392. This application June 5, 1975, Ser. No. 583,893
Claims priority, application France, Dec. 15, 1972, 72.44673
Int. Cl.² C07D 459/00
U.S. Cl. 260—293.53 **1 Claim**

1. Apovincaldehyde of the formula:



and its stereoisomers.

4,001,252

2-AMINO-3,4-DIHYDROPYRIDINES

Horst Meyer; Friedrich Bossert; Wulf Vater, all of Wuppertal, and Kurt Stoepel, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 25, 1974, Ser. No. 445,166

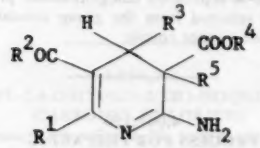
Claims priority, application Germany, Mar. 3, 1973, 2310747

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² 424 *258, 266*

U.S. Cl. 260—294.8 G **15 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen, straight or branched chain lower alkyl, or amino;

R^2 is straight or branched chain lower alkyl or OR′ wherein R′ is straight or branched chain lower alkyl, lower alkenyl, lower alkynyl or alkoxyalkyl of 2 to 4 carbon atoms;

R^3 is straight or branched chain alkyl of 1 to 6 carbon atoms; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkynyl of 2 to 6 carbon atoms; or unsubstituted or substituted phenyl or naphthyl which when substituted bears 1, 2 or 3 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, azido, cyano, phenyl, nitro, trifluoromethyl, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety and SO_n-alkyl of 1 to 4 carbon atoms in the alkyl moiety wherein n is 0, 1 or 2;

R^4 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, or straight or branched chain alkynyl of 2 to 6 carbon atoms; and

R^5 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, straight or branched chain alkynyl of 2 to 6 carbon atoms, or benzyl.

4,001,253

NAPHTHOLACTAM DYESTUFFS

Horst Harnisch, Cologne, and Alfred Brack, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

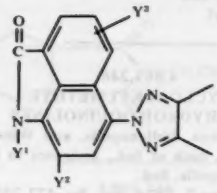
Division of Ser. No. 363,989, May 25, 1973, Pat. No. 3,950,347. This application Aug. 21, 1975, Ser. No. 606,546

Claims priority, application Germany, May 26, 1972, 2225648

Int. Cl.² C07D *249/22*

U.S. Cl. 260—294.8 B **6 Claims**

1. Naphtholactam dyestuff of the formula



D

wherein

Y^1 is hydrogen, C_1–C_2-alkyl, benzyl, C_1–C_2-alkylbenzyl, chlorobenzyl, C_1–C_2-alkoxybenzyl, cyanobenzyl, phenyl, C_1–C_2-alkylphenyl, chlorophenyl, C_1–C_2-alkoxyphenyl, cyclohexyl, or C_1–C_2-alkyl substituted by chloro, hydroxy, cyano, carboxy, carboxylic acid (C_1–C_4-alkyl) ester, benzyl ester, carboxylic acid amide, or C_1–C_2-alkoxy;

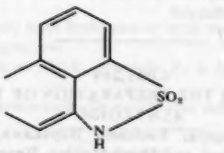
Y^2 is hydrogen, chloro, bromo, C_1–C_2-alkyl, C_1–C_2-alkoxy, amino, or sulpho;

Y^1 and Y^2, when taken together, are propylene;

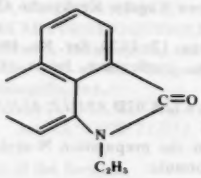
Y^3 is hydrogen or C_1–C_2-alkoxy;

D represents the remaining members of a naphthalene ring which is unsubstituted or substituted by hydroxy, C_1–C_4-alkoxy, C_1–C_4-alkyl, chlorine, bromine, cyano, carboxy, carboxylic acid C_1–C_2-alkyl ester, sulphonic acid, carboxylic acid amide, sulphonic acid amide, carboxylic acid C_1–C_4-alkylamide, carboxylic acid di-C_1–C_4-alkylamide, sulphonic acid C_1–C_4-alkylamide, sulphonic acid di-C_1–C_4-alkylamide, amino, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, or C_2–C_3-alkylcarbonylamino; and

D additionally represents



or



4,001,254

ISOTHIOCYANOPYRIDINE DERIVATIVES

Wolfgang Schmid, Therwil; Ernst Gutzwiller, Rheinfelden, and Urs Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

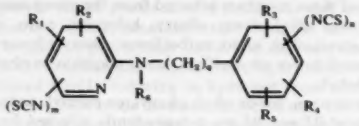
Division of Ser. No. 386,796, Aug. 8, 1973, Pat. No. 3,929,806. This application Oct. 10, 1975, Ser. No. 621,443

Claims priority, application Switzerland, Aug. 10, 1972, 11886/72; Aug. 10, 1972, 11887/72

Int. Cl.² C07D *213/74*

U.S. Cl. 260—294.8 E **5 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen,

R_2 is hydrogen,

R_3 is hydrogen, halogen, methyl, methoxy, ethoxy, butoxy, hydroxy, dimethylamino, phenoxy, or phenyl,

R_4 and R_5 are hydrogen,

R_6 is hydrogen,

m is 1,

n is 0,

q is 0 or 1.

4,001,255

PROCESS FOR THE PRODUCTION OF CYANOPYRIDINES

Francois Moulin, Neuchatel, and Karl-Josef Boosen, Erlach, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed Aug. 2, 1974, Ser. No. 494,339

Claims priority, application Switzerland, Aug. 10, 1973, 11550/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **14 Claims**

1. In a process for the production of a cyanopyridine by conversion of a monoalkylpyridine, the alkyl having one to four carbon atoms, with (a) oxygen or air and (b) ammonia in the gaseous phase in the presence of a catalyst, the improvement which consisting essentially of using a catalyst which consists of pure V_2O_5 having a grain size of 50 to 500 μ and a specific surface of up to 10 m^2/g and conducting the reaction at a temperature which is calculated according to the formula $T = S.m + b$, wherein T is the reaction temperature in °C., S is the specific surface of the catalyst in m^2/g, m is a factor of −4 to −6 and b a number from 320 to 322.

4,001,256

PYRIDYLALKYL PHENYL UREAS AND THEIR N-OXIDES

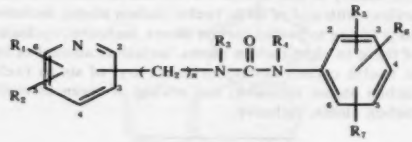
William A. Callahan; Eldridge Myles Glenn, both of Kalamazoo, and Douglas L. Rector, Parchment, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 428,361, Dec. 26, 1973, abandoned. This application June 25, 1975, Ser. No. 590,031

Int. Cl.² C07D *213/38*

U.S. Cl. 260—295 E **11 Claims**

1. A compound selected from those of formula:



and a pharmaceutically acceptable acid addition salt thereof wherein R_1 and R_2 are each selected from the group consisting of hydrogen, halogen, alkyl of one to six carbon atoms, inclusive, cycloalkyl of three to six carbon atoms, inclusive, alkenyl of two to six carbon atoms, inclusive, phenyl, alkoxy of one to twelve carbon atoms, inclusive, nitro, amino, alkylamino with alkyl of one to twelve carbon atoms, inclusive, dialkylamino with each alkyl having one to twelve carbon atoms, inclusive, acylamino with the acyl group being alkyl of one to twelve carbon atoms, inclusive, and trihalomethyl;

R_3 and R_4 are each selected from the group consisting of hydrogen, alkyl of one to four carbon atoms, inclusive, cycloalkyl of three to four carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, and aryl of six to twelve carbon atoms, inclusive, substituted with a group selected from halogen, alkoxy of one to four carbon atoms, inclusive, nitro, aryloxy with aryl of six to twelve carbon atoms, inclusive alkyl of one to twelve carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive, alkenyl of two to twelve carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, and aralkyl of seven to twelve carbon atoms, inclusive;

R_5 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, iodo, alkyl of one to twelve carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive alkenyl of two to twelve carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, alkoxy of one to twelve carbon atoms, inclusive, halogen substituted alkyl of one to twelve carbon atoms, inclusive, halogen substituted cycloalkyl of three to eight carbon atoms, inclusive, halogen substituted alkenyl of two to twelve carbon atoms, inclusive, halogen substituted aryl of six to twelve carbon atoms, inclusive, and halogen substituted aralkyl of seven to twelve carbon atoms, inclusive;

R_6 and R_7 are each selected from the group consisting of nitro, amino, acylamino with acyl being alkyl of one to twelve carbon atoms, inclusive, alkylamino with alkyl of one to twelve carbon atoms, inclusive, dialkylamino with each alkyl of one to twelve carbon atoms, inclusive, aryloxy with aryl of six to twelve carbon atoms, inclusive, and a group R_5 as previously defined: and n is an integer of from 1 to 2, inclusive; provided that when one of R_5, R_6 and R_7 is chlorine, the pyridine ring moiety of said compound is attached to the rest of the molecule through the pyridyl ring carbon atom at the four carbon position; and further provided that when R_1 and R_2 are both selected from the group consisting of hydrogen and alkyl of one to six carbon atoms, inclusive, said compound is selected from those wherein R_7 is selected from the group consisting of cycloalkyl of three to eight carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, alkenyl of two to twelve carbon atoms, inclusive, amino, acylamino with acyl being alkyl from one to twelve carbon atoms, inclusive, aikylamino with alkyl of one to twelve carbon atoms, inclusive, dialkylamino with each alkyl being one to twelve carbon atoms, inclusive, and aryloxy with aryl of six to twelve carbon atoms, inclusive; and those compounds wherein R_4 is selected from the group consisting of cycloalkyl of three to six carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, and aryl substituted

with a group selected from the group consisting of halogen, alkoxy of one to four carbon atoms, inclusive, nitro, aryloxy with aryl of six to twelve carbon atoms, inclusive, alkyl of one to twelve carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive, alkenyl of two to twelve carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, and aralkyl of seven to twelve carbon atoms, inclusive.

4,001,257

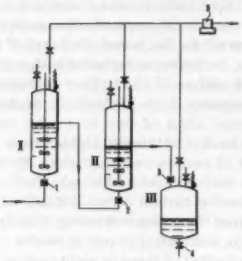
PROCESS FOR PRODUCING NICOTINIC ACID

Keiji Masuda; Hidenori Kizawa, both of Nakago, and Yasuhiko Otaki, Joetsu, all of Japan, assignors to Nippon Soda Company Limted, Tokyo, Japan

Continuation-in-part of Ser. No. 303,028, Dec. 2, 1972, abandoned. This application Aug. 8, 1975, Ser. No. 603,133

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **6 Claims**



1. A process for the production of nicotinic acid which consists essentially of the steps of reacting 2-methyl-5-ethylpyridine with an amount of nitric acid which is 100 to 108 weight percent of that theoretically required to oxidize the 2-methyl-5-ethylpyridine to nicotinic acid, at a temperature of 225° C. to 235° C. and a pressure of 30 to 45 kg/cm² for 5 to 30 minutes, to oxidize said 2-methyl-5-ethylpyridine to nicotinic acid, while maintaining the pH of the reaction mixture at 1.5 to 3.5, concentrating the resulting reaction mixture while maintaining the pH thereof at 1.5 to 3.5, cooling the concentrated reaction mixture to precipitate nicotinic acid, and separating the nicotinic acid having a purity of at least about 98 percent and in a yield of at least about 85 to 90 weight percent.

4,001,258

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Oct. 17, 1974, Ser. No. 515,642

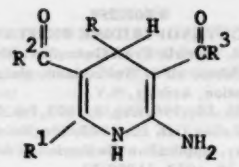
Claims priority, application Germany, Mar. 6, 1972, 2210674

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *213/56*

U.S. Cl. 260—295.5 A **5 Claims**

1. A compound of the formula:



wherein

R is phenyl; substituted phenyl in which the substituents are one of three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio or phenyl; or naphthyl;

R^1 is hydrogen, lower alkyl, phenyl, or pyridyl; and one or both of R^2 and R^3 are independently selected from the group consisting of amino, lower alkyl-amino or di(lower alkyl)amino and the other of R^2 and R^3 when both are not so selected is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy or lower alkynyloxy.

4,001,259

3,6-DIAMINO-3,4-DIHYDRO-2-PYRIDONES

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 30, 1975, Ser. No. 545,299

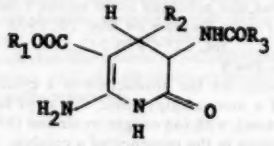
Claims priority, application Germany, Feb. 9, 1974, 2406200

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl. C07d *213/56*

U.S. Cl. 260—295.5 A **10 Claims**

1. A 3,6-diamino-3,4-dihydro-2-pyridone of the formula



wherein

R_1 is straight or branched chain alkyl of 1 to 6 carbon atoms; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkoxyalkyl of 2 to 6 carbon atoms;

R_2 is straight or branched chain alkyl of 1 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; phenyl unsubstituted or substituted by 1 or 2 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, nitro, cyano, trifluoromethyl, carb(lower alkoxy) of 1 to 4 carbon atoms in the alkoxy portion and SO_n-(lower alkyl) in which alkyl contains 1 to 4 carbon atoms and n is 0 or 2; naphthyl; and

R_3 is straight or branched chain alkyl of 1 to 6 carbon atoms; or phenyl unsubstituted or substituted by methyl, ethyl, methoxy, ethoxy, nitro, trifluoromethyl or chloro or bromo.

4,001,260

SYNTHESIS OF AROMATIC AMINES BY REACTION OF AROMATIC COMPOUNDS WITH AMMONIA

Thomas W. Del Pesco, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1973, Ser. No. 429,027

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.[2] C07C *85/02*

U.S. Cl. 260—296 R 6 Claims

1. In a process for aminating an aromatic compound selected from benzene, pyridine and aniline by reaction with ammonia at a temperature of from about 150°C. to about 500°C. and at a pressure of from about 10 to about 1000 atmospheres in the presence of a cataloreactant comprising nickel/nickel oxide/zirconium oxide wherein the ratio of nickel to nickel oxide is from 0.001:1 to 10:1 and the ratio of total nickel to zirconium oxide is from 0.1:1 to 100:1 that was conditioned by (1) reducing in hydrogen from about 10 to 90% of the nickel oxide to metallic nickel and (2) oxidizing with an oxygen containing gas, the improvement which comprises carrying out the reaction in intimate molecular contact with the conditioned cataloreactant which is treated with from about 0.01 to about 20 moles of ammonia per mole of total nickel in the conditioned cataloreactant at a temperature of from about 20°C. to about 500°C. for from about 1 to about 60 minutes prior to introduction to the amination reactants.

4,001,261

PROCESS FOR THE PRODUCTION OF 1-[(DIMETHYLAMINO)METHYL]-6-PHENYL-4H-IMIDAZO[1,2-a][1,4]-BENZODIAZEPINE

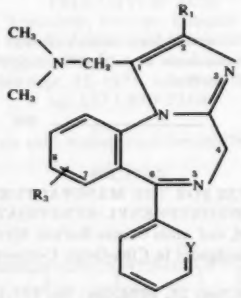
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 20, 1975, Ser. No. 623,971

Int. Cl.[2] C07D *213/02*, *487/04*

U.S. Cl. 260—296 T 7 Claims

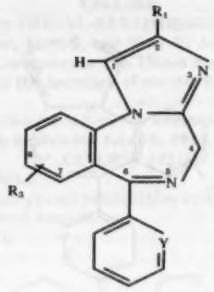
1. A process for the production of 1-[(dimethylamino)-methyl]-6-substituted-4H-imidazo[1,2-a][1,4]benzodiazepines of the formula II:



II

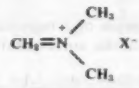
wherein R_1 is hydrogen or alkyl of 1 or 2 carbon atoms, inclusive; wherein Y is nitrogen or C-R_2 in which R_2 is hydrogen, fluoro, or chloro; and wherein R_3 is hydrogen, fluoro, chloro, bromo, trifluoromethyl; which comprises:

treating a compound of formula I:



I

wherein R_1, Y and R_3 are defined as above, in solution between 50°–100° C. with a compound of formula IV



wherein X^- is the anion of monovalent inorganic or organic acid to yield the corresponding compound of formula II.

4,001,262

PROCESS FOR THE PRODUCTION OF 1-[(DIMETHYLAMINO)METHYL]-6-PHENYL-4H-TRIAZOLO[4,3-a][1,4]-BENZODIAZEPINE

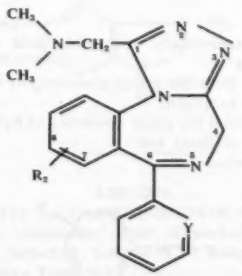
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 20, 1975, Ser. No. 623,972

Int. Cl.[2] C07D *213/72*, *403/06*

U.S. Cl. 260—296 T 7 Claims

1. A process for the production of 1-[(dimethylamino)methyl]-6-substituted-4H-s-triazolo[4,3-a][1,4]benzodiazepines of the formula II:

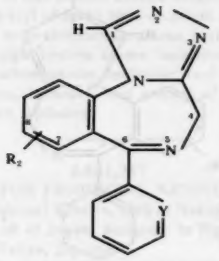


II

wherein Y is nitrogen or

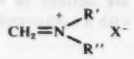
in which R_1 is hydrogen, fluoro, or chloro; and wherein R_2 is hydrogen, fluoro, chloro, bromo, trifluoromethyl, or nitro; which comprises:

treating a compound of formula I:



I

wherein R_2 and Y are defined as above, in solution, between 50°–100° C. with a compound of formula IV



IV

wherein X^- is the anion of a monovalent inorganic or organic acid, to yield the corresponding compound of formula II above.

4,001,263

5-ARYL-1,2,3,4-TETRAHYDRO-γ-CARBOLINES

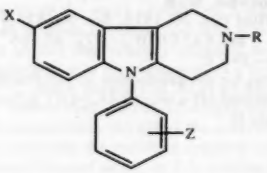
Jacob J. Plattner, East Lyme; Charles A. Harbert, and James R. Tretter, both of Waterford, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 456,640, April 1, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,354

Int. Cl.² C07D *471/04*

U.S. Cl. 260—296 A **25 Claims**

1. A compound selected from those of the formula

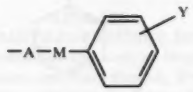


and the pharmaceutically acceptable acid addition salts thereof, wherein

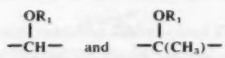
X is selected from the group consisting of fluoro, chloro, bromo and hydrogen;

Z is selected from the group consisting of hydrogen, fluoro, chloro and methoxy and

R is of the formula



wherein A is alkylene having 1 to 5 carbon atoms, M is selected from the group consisting of



wherein R_1 is hydrogen and Y is selected from the group consisting of fluoro, chloro, methyl and hydrogen.

4,001,264

ENZYME COMPLEXES AND THEIR USE

Thomas Adrian Savidge, Stayning, and Lawson William Powell, Worthing, both of England, assignors to Beecham Group Limited, England

Filed Dec. 12, 1974, Ser. No. 532,051

Claims priority, application United Kingdom, Dec. 28, 1973, 59978/73

Int. Cl.² C07D *499/42*

U.S. Cl. 260—306.7 C **8 Claims**

1. In the process for preparing 6-aminopenicillanic acid, which process consists essentially of maintaining an aqueous solution of benzylpenicillin or phenoxymethylpenicillin or a salt thereof at a pH of from 6.0 to 9.0 while treating it with a water-insoluble enzyme complex, wherein a penicillin acylase enzyme has been adsorbed on a water-insoluble polymer substrate and cross-linked with a cross-linking agent selected from the group consisting of glutaraldehyde, glyoxal and formaldehyde, the improvement wherein the said polymer substrate for the said enzyme is a water-insoluble polymer or copolymer of methacrylic acid.

4,001,265

3,4-DIMETHYL-5-ISOXAZOLYLSULFAMYLANILINE

Daniel Tim-Wo Chu, Greenfield Park, and David Lyon Garmaise, Montreal, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

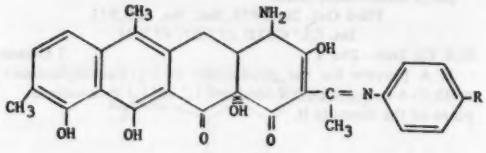
Division of Ser. No. 378,305, July 11, 1973, Pat. No. 3,894,061. This application Mar. 3, 1975, Ser. No. 554,848

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *261/16*

U.S. Cl. 260—307 H **2 Claims**

1. A compound of the formula:



wherein R is 4-dimethyl-5-isoxazolylsulfamyl or the corresponding tautomeric form or a pharmaceutically acceptable acid addition salt thereof.

4,001,266

PROCESS FOR THE MANUFACTURE OF 2-(2-HYDROXYPHENYL)BENZTRIAZOLES

Jean Rody, Basel, and Alain Claude Rochat, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

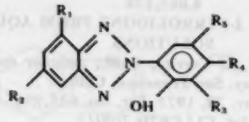
Filed Nov. 25, 1974, Ser. No. 527,180

Claims priority, application Switzerland, Nov. 27, 1973, 16636/73

Int. Cl.² C07D *249/20*

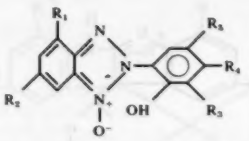
U.S. Cl. 260—308 B **9 Claims**

1. A process for the manufacture of a 2-(2-hydroxyphenyl)-benzotriazole of the formula I



(I)

wherein R_1 denotes hydrogen, chlorine or bromine, R_2 denotes hydrogen, alkyl having 1 to 8 carbon atoms, alkoxy having 1 to 12 carbon atoms, alkylsulphonyl having 1 to 12 carbon atoms, acylamino having 2 to 12 carbon atoms, $-SO_3H$, $-COOH$, bromine or chlorine, R_3 denotes hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 6 to 8 carbon atoms, aralkyl having 7 to 11 carbon atoms, phenyl, chlorine or bromine, R_4 denotes hydrogen, methyl, alkoxy having 1 to 12 carbon atoms, or OH, and R_5 denotes hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 6 to 8 carbon atoms, aralkyl having 7 to 11 carbon atoms, phenyl, carboxyalkyl having 2 to 13 carbon atoms, alkoxy having 1 to 12 carbon atoms, acylamino having 2 to 12 carbon atoms, chlorine or bromine, which comprises reacting in a molar ratio 1 mole of a 2-(2-hydroxyphenyl)benzotriazole-1-oxide of formula III



(III)

with 0.5 to 0.6 moles of hydrazine hydrate in the presence of a base and at a temperature above 100° C in an ether solvent with a boiling point over 140° C and selected from the group consisting of phenyl methyl ether, phenyl ethyl ether, diphenyl ether, ethylene glycol dibutyl ether, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, diethylene glycol dibutyl ether, triethylene glycol dimethyl ether, and tetraethylene glycol dimethyl ether, and removing the water formed by azeotropic distillation.

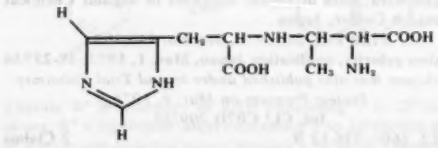
4,001,267

FELDAMYCIC ACID

Alexander D. Argoudelis, Portage; Lubomir Baczynskyj, and Stephen A. Mizsak, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 22, 1975, Ser. No. 615,769
Int. Cl.² C07D *233/64*
U.S. Cl. 260—309 **5 Claims**

1. Feldamycic acid, a compound having the following structure:



and acid and base addition salts thereof.

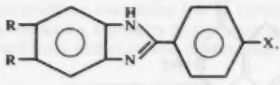
4,001,268

SUBSTITUTED PHENYL-BENZIMIDAZO COMPOUNDS

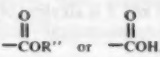
Robert F. Kovar, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 495,471, Aug. 7, 1974, abandoned. This application July 18, 1975, Ser. No. 597,060
Int. Cl.² C07D *235/18*
U.S. Cl. 260—309.2 **3 Claims**

3. A substituted phenyl-benzimidazo compound having the following structural formula:



wherein R is $-NHSO_2R'$ and X is



with R' being phenyl, tolyl, xylyl, naphthyl, diphenyl, methylnaphthyl, benzyl, chlorophenyl, bromophenyl, iodophenyl, fluorophenyl, chloronaphthyl, chlorodiphenyl, methyl, ethyl, propyl, amyl, octyl, decyl, dodecyl, octadecyl, cyclohexyl, cycloheptyl, methylcyclohexyl, or ethylcycloheptyl, and with R'' being methyl, ethyl, propyl, butyl, cyclopropyl, cyclopentyl, cyclohexyl, cycloheptyl, tolyl, xylyl, phenyl, biphenyl, or naphthyl.

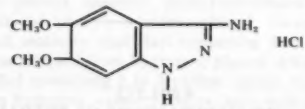
4,001,269

3-AMINO-5,6-DIMETHOXYINDAZOLE HYDROCHLORIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,447
Int. Cl.² C07D *231/56;* **A61K** *31/415*
U.S. Cl. 260—310 C **1 Claim**

1. The compound of the formula:



4,001,270

9-BENZOYL-1,2,3,4-TETRAHYDROCARBAZOLE

Ernest John Alexander, East Greenbush, and Aram Mooradian, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 514,767, Oct. 15, 1974, Pat. No. 3,948,939, which is a continuation-in-part of Ser. No. 314,099, Dec. 11, 1972, Pat. No. 3,905,998, which is a continuation-in-part of Ser. No. 200,205, Nov. 18, 1971, Pat. No. 3,758,496, which is a continuation-in-part of Ser. No. 42,620, June 2, 1970, Pat. No. 3,687,969. This application Dec. 12, 1975, Ser. No. 640,249
Int. Cl.² C07D *209/86*
U.S. Cl. 260—315 **1 Claim**

1. 9-Benzoyl-3-(N-phenylcarbamoyloxymethyl)-1,2,3,4-tetrahydrocarbazole.

4,001,271

3-(ISOPROPYL AMINO ALKOXY)-2-PHENYL-ISOINDOLIN-1-ONES

Claude Cotrel, Paris; Claude Jeanmart, Brunoy, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Feb. 7, 1974, Ser. No. 440,548

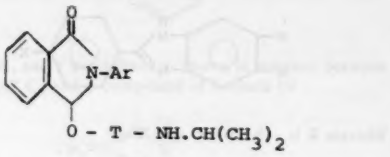
Claims priority, application France, Feb. 8, 1973, 73.04460

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07D *209/46*

U.S. Cl. 260—325 PH **6 Claims**

1. An isoindoline derivative of the formula:



wherein Ar is phenyl and T is alkylene of 2 through 6 carbon atoms, and non-toxic pharmaceutically-acceptable acid addition salts thereof.

4,001,272

HERBICIDAL 2-FLUORO-4-HALO-PHENYL-4,5,6,7-TETRAHYDRO-2H-ISOINDOLE-1,3-DIONES

Steven Jerome Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 502,968, Sept. 3, 1974, abandoned. This application Dec. 24, 1974, Ser. No. 536,322

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07D *209/48*

U.S. Cl. 260—326 HL **3 Claims**

1. The compound 2-(4-chloro-2-fluorophenyl)-4,5,6,7-tetrahydro-2H-isoindole-1,3-dione.

3. The compound 2-(2,4-difluorophenyl)-4,5,6,7-tetrahydro-2H-isoindole-1,3-dione.

4,001,273

CONTINUOUS MANUFACTURE OF PHTHALIMIDE

Eckhard Hetzel; Ludwig Vogel, both of Frankenthal; Gerhard Rotermund, Heidelberg, and Hans Christoph Horn, Lambsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 8, 1974, Ser. No. 486,678

Claims priority, application Germany, July 10, 1973, 2334916

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07D *209/48*

U.S. Cl. 260—326 R **7 Claims**

1. A process for the continuous manufacture of phthalimide which comprises reacting phthalic anhydride with ammonia at a temperature of from about 135°C. to 300°C., washing the off-gas with a melt of substantially pure phthalimide or a melt of crude phthalimide obtained as the end product from the reaction of phthalic anhydride with ammonia and containing at least 70% by weight of phthalimide, at a temperature of not less than 210°C, and then recycling the melt to the reaction.

4,001,274

RECOVERY OF 2-PYRROLIDONE FROM AQUEOUS SOLUTIONS

Kiyoshi Katsumoto, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 28, 1975, Ser. No. 635,996

Int. Cl.² C07D *207/12*

U.S. Cl. 260—326.5 FN **6 Claims**

1. A process for recovering 2-pyrrolidone from an aqueous solution, which includes the step of adding to the solution potassium hydrogen phosphate in an amount sufficient to cause separation of the solution into two liquid phases, one of which contains substantially more 2-pyrrolidone than the other.

4,001,275

INDOLE DEHYDRO PHTHALIDES AND NAPHTHALIDES

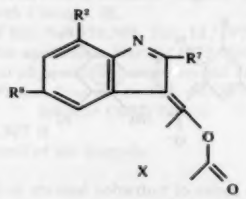
Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 446,732, Feb. 28, 1974, Pat. No. 3,941,807, which is a continuation-in-part of Ser. No. 108,662, Jan. 21, 1971, abandoned. This application Sept. 29, 1975, Ser. No. 617,271

Int. Cl.² C07D *209/10, 209/12, 209/14, 209/18*

U.S. Cl. 260—326.12 R **7 Claims**

1. A compound of the formula:



wherein R^2 is selected from $-NH-SO_2-R_1$ wherein R_1 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl and $-SO_2-NH-R_2$ wherein R_2 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substitued alkyl and alkyl-substituted phenyl; R^7 is selected from hydrogen, phenyl, o-hydroxyphenyl and alkyl containing 1 to 3 carbon atoms; R^8 is selected from hydrogen, cyano, carboxy, halo, trifluoromethyl, alkoxy containing 1 to 18 carbon atoms and $-SO_2-R_3$ wherein R_3 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; and X represents the carbon atoms necessary to complete a ring-closing moiety selected from phthalide, unsubstituted or substituted in one of the 4- or 7-positions with carboxy, and naphthalide, unsubstituted.

4,001,276

α-ALKYL(OR ARYL)THIO-5-HYDROXYTRYPTOPHAN DERIVATIVE AND THE PREPARATION PROCESS THEREOF

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Japan

Filed Feb. 26, 1974, Ser. No. 446,107

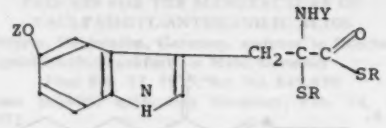
Claims priority, application Japan, Mar. 1, 1973, 48-23734

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C07D *209/20*

U.S. Cl. 260—326.12 R **2 Claims**

1. A thio-5-hydroxytryptophan derivative expressed by the following formula



(I)

wherein R is alkyl having one to three carbon atoms, Y is acetyl, trifluoroacetyl, benzyloxycarbonyl or p-toluenesulfonyl and Z is methyl, benzyl, benzoyl or acetyl.

4,001,277

3,3-DISUBSTITUTED PHTHALIDES AND NAPHTHALIDES

Eva R. Karger, Arlington, and Paul T. MacGregor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

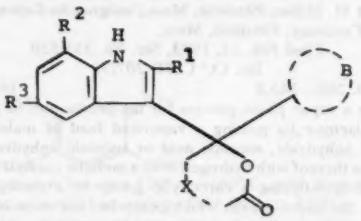
Continuation-in-part of Ser. No. 202,558, Nov. 26, 1971, Pat. No. 3,816,124. This application Apr. 1, 1974, Ser. No. 456,869

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

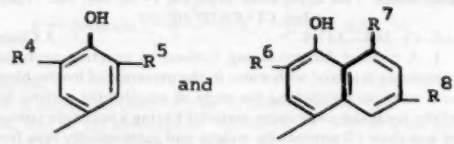
Int. Cl.² C07D *209/18*

U.S. Cl. 260—326.13 R **13 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, alkyl containing 1 to 20 carbon atoms or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —NH— and selected from carboxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, —NH—SO_2—R and —SO_2—NH—R′ wherein said R and R′ each are hydrocarbon groups selected from alkyl containing 1 to 20 carbon atoms, phenyl, naphthyl, alkylsubstituted phenyl containing up to 20 carbon atoms and phenyl-substituted alkyl containing up to 20 carbon atoms; R^2 is hydrogen or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —NH— and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, —NH—SO_2—R and —SO_2—NH—R′ wherein R and R′ have the same meaning given above, not more than one of R^1 and R^2 being a hydrogen-bonding group; R^3 is hydrogen or alkoxy containing 1 to 18 carbon atoms; B is selected from



wherein R^4 is hydrogen or alkyl containing 1 to 20 carbon atoms, R^5 is hydrogen, alkyl containing 1 to 20 carbon atoms or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —OH and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, —NH-SO_2—R and —SO_2—NH—R′ wherein R and R′ have the same meaning given above, R^6 is hydrogen, alkyl containing 1 to 20 carbon atoms or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —OH and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, —NH—SO_2—R and —SO_2—NH—R′ wherein R and R′ have the same meaning given above, R^7 is hydrogen or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —OH and selected from carboxy, hydroxy, bis trifluoromethyl carbinol, —NH—SO_2—R and —SO_2—NH—R′ wherein R and R′ have the same meaning given above, not more than one of R^6 and R^7 being a hydrogen-bonding group, R^8 is hydrogen or alkoxy containing 1 to 18 carbon atoms, and X represents the atoms necessary to complete a ring-closing moiety selected from phthalide and naphthalide.

4,001,278

INDOLE PHTHALIDES AND NAPHTHALIDES

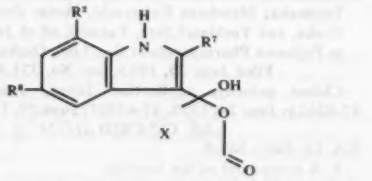
Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 446,732, Feb. 28, 1974, Pat. No. 3,941,807, which is a continuation-in-part of Ser. No. 108,662, Jan. 21, 1971, abandoned. This application Sept. 29, 1975, Ser. No. 617,300

Int. Cl.² C07D *209/10, 209/12, 209/14, 209/18*

U.S. Cl. 260—326.12 R **8 Claims**

1. A compound of the formula:



wherein R^2 is selected from hydrogen; hydroxy; carboxy; —NH—SO_2—R_1 wherein R_1 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; —SO_2—NH—R_2 wherein R_2 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; o-hydroxyphenyl; bis-trifluoromethylcarbinol; methoxy; and alkyl containing 1 to 16 carbon atoms; R^7 is selected from hydrogen; phenyl; o-hydroxyphenyl; and alkyl containing 1 to 3 carbon atoms; and R^8 is selected from hydrogen; cyano; carboxy; halo; trifluoromethyl; —SO_2—R_3 wherein R_3 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; and alkoxy containing 1 to 18 carbon atoms; and X represents the carbon atoms necessary to complete a ring-closing moiety selected from phthalide, unsubstituted or substituted in the 4- or 7- position with carboxy, and naphthalide, unsubstituted.

4,001,279

ASYMMETRIC MACROCYCLES CONTAINING OXYGEN AND BINAPHTHYL RING MEMBERS

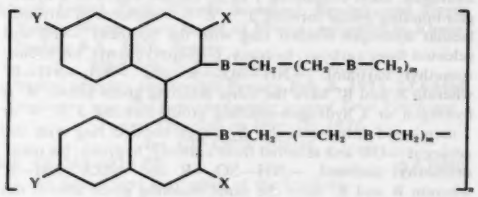
Donald J. Cram, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 346,089, March 29, 1973, abandoned. This application Mar. 5, 1974, Ser. No. 448,333

Int. Cl.² C07D *321/00*

U.S. Cl. 260—340.3 **23 Claims**

1. A compound according to the formula:



wherein

n is 1 to 3; each *m* taken separately = 0 to 5, the sum being at least 1;

B is —O—;

X is $(CH_2)_vR$, where $v = 1$ to 3 and R = H, CH_3, CO_2H, OH or OCH_3, or X is CH_2OH: CH_2Cl; $CH_2OCH_2CO_2H$; $CH_2OCH_2CO_2CH_3$; $CH_2SCH_2CO_2H$; $CH_2CH_2CO_2H$; $CH_2SCH_2CH_2CO_2H$;

Y is H, Br, CO_2H, CH_2OH, CH_2Cl, $CH_2OCH_2CO_2H$, $CH_2SCH_2CO_2H$, $CH_2CO_2CH_2(CH_2)_{16}C(CH_3)_2$ or $CH_3(CH_2)_{17}CHCH_3$.

4,001,280

CHROMONE DERIVATIVES

Suminori Umio, Kawanishi; Ikuo Ueda, Yao; Masaaki Matsuo, Toyonaka; Masakazu Kobayashi, Ikeda; Osamu Nakaguti, Osaka, and Yoshinari Sato, Tanashi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

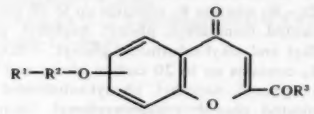
Filed June 20, 1973, Ser. No. 371,852

Claims priority, application Japan, June 21, 1972, 47-62626; June 24, 1972, 47-63407; June 29, 1972, 47-65573

Int. Cl.² C07D *311/24*

U.S. Cl. 260—340.5 **4 Claims**

1. A compound of the formula:



wherein R^1 is aryloxy substituted with lower alkylenedioxy, said aryloxy being phenoxy, napthyloxy, tolyloxy, xyloxy, mesityloxy or cumenyloxy;

R^2 is lower alkylene;

R^3 is hydroxy or lower alkoxy or a nontoxic, pharmaceutically acceptable salt thereof.

4,001,281

2-OXO-CYCLOPENTA[b]FURAN-5α-CARBOXYLIC ACID ESTERS

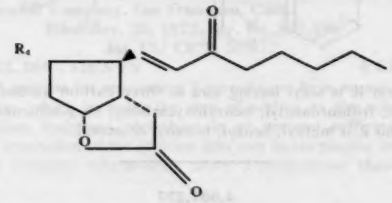
Frank Kienzle, Therwil, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 381,322, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,633, Nov. 25, 1972, abandoned. This application Sept. 10, 1975, Ser. No. 612,135

Int. Cl.² C07D *307/83*

U.S. Cl. 260—343.3 R **2 Claims**

1. A compound of the formula:



wherein R_4 is hydrogen, lower alkyl, carboxy or carboxy protected with a group convertible thereto by hydrolysis; or enantiomers or racemates thereof.

4,001,282

PROCESS FOR PRODUCING GAMMA-BUTYROLACTONE

Elwood M. Miller, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 12, 1973, Ser. No. 331,530

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **16 Claims**

1. In a vapor phase process for the production of gamma-butyrolactone by passing a vaporized feed of maleic acid, maleic anhydride, succinic acid or succinic anhydride or a mixture thereof with hydrogen over a metallic catalyst capable of hydrogenolyzing a carboxylic group to a methyleneoxy group, the improvement which comprises the steps of:

i. providing a vaporized mixture of (a) maleic acid, maleic anhydride, succinic acid, succinic anhydride or a mixture thereof, and (b) water at a ratio of from 10 to 60 parts by weight of acid/anhydride to 90 to 40 parts by weight of water, and

ii. contacting the resulting vaporized mixture and hydrogen in the vapor phase with a metallic catalyst capable of hydrogenolyzing a carboxylic group to a methyleneoxy group.

4,001,283

METHOD FOR THE MANUFACTURE OF FURFURAL USING HYDROGEN CHLORIDE

Preston A. Wells, Jr., 345 Locust Road, Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 761,734, Sept. 23, 1974, abandoned. This application Sept. 14, 1970, Ser. No. 71,831

Int. Cl.² C07D *307/50*

U.S. Cl. 260—347.9 **5 Claims**

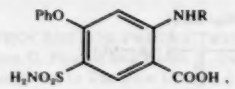
1. A method for producing furfural by reacting pentosan-containing material with water in the presence of hydrochloric acid catalyst, comprising the steps of establishing a static bed of the pentosan-containing material having a moisture content of less than 10 percent by weight and substantially free from hydrochloric acid catalyst, introducing steam and hydrogen chloride concurrently into the bed adjacent one end thereof, and recovering a furfural-containing mixture of gases at the other end of the bed, there being substantially no liquid water introduced into the bed before or during the course of the reaction.

4,001,284
PROCESS FOR THE MANUFACTURE OF 5-SULFAMOYL-ANTHRANILIC ACIDS

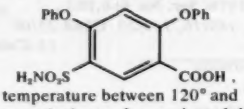
Karl Sturm, Heidesheim, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 12, 1975, Ser. No. 549,430
Claims priority, application Germany, Feb. 14, 1974, 2406972
Int. Cl.² C07C *143/78, 143/80*
U.S. Cl. 260—397.7 R **3 Claims**

1. A method of preferentially preparing a 5-sulfamoylanthranilic acid of the formula



in a yield of 70–90 percent, where in Ph is phenyl or phenyl mono- or di-substituted with a member selected from the group consisting of halogen, lower alkyl, and lower alkoxy, and R is furylmethyl, thienylmethyl, pyridylmethyl, benzyl, benzyl mono- or di-substituted by halogen, lower alkyl, or lower alkoxy, or is cycloalkylmethyl having from 5 to 8 carbon atoms in the ring or heterocyclooxyalkyl methyl having from 4 to 5 carbon atoms in the ring, which method comprises reacting a 5-sulfamoylcarboxylic acid of the formula



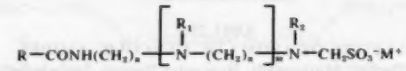
at a temperature between 120° and 160° C., with from 1 to 10 molar equivalents of an amine of the formula RNH_2.

4,001,285
AMIDOPOLYAMINESULFONATES

Richard Hochreuter, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 274,232, July 24, 1972, abandoned. This application Feb. 3, 1975, Ser. No. 546,524
Claims priority, application Switzerland, July 27, 1971, 11040/71
Int. Cl.² C07C *143/90*
U.S. Cl. 260—401 **12 Claims**

1. A compound of the formula



wherein

R is alkyl or alkenyl of 5 to 22 carbon atoms,

R_1 and R_2 are hydrogen or $-CH_2SO_3^-M^+$ with at least one of R_1 and R_2 being $-CH_2SO_3^-M^+$,

m is an integer 0 to 4,

n is 2 or 3,

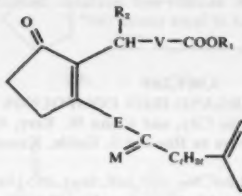
M is hydrogen, ammonium or mono-, di- or triethanolammonium cation or an equivalent of an alkali metal or alkaline earth metal cation.

4,001,286
PHENYL-SUBSTITUTED PROSTAGLANDIN-β-TYPE ANOLOGS

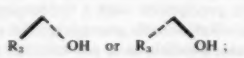
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,011, Jan. 7, 1974, Pat. No. 3,987,087, which is a continuation-in-part of Ser. No. 167,446, July 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 86,303, Nov. 2, 1970, abandoned. This application Dec. 29, 1975, Ser. No. 645,277
Int. Cl.² C07C *5/22, 69/76*
U.S. Cl. 260—410.9 R **91 Claims**

1. A compound of the formula



wherein E is $-CH_2-CHR_4-$ or trans $-CH=CR_4-$; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein M is



wherein R_2, R_3, and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_7H_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between

and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; and wherein V is (a) alkylene of 3 to 12 carbon atoms, inclusive, substituted with zero, one, 2, 3, or 4 fluoro, with 3 to 7 carbon atoms, inclusive, between $-CHR_3-$ and $COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to $-COOR_1$, (b) $-CH=CH-A-$, cis or trans, or (c) $-C\equiv C-A-$, wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, 2, 3, or 4 fluoro, with one to 5 carbon atoms, inclusive, between $=CH-$ (or $\equiv C-$) and $-COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to $-COOR_1$, with the further proviso that when E is $-CH_2-CHR_4-$ V is (a) above; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,001,287

REACTION PRODUCT OF NORMAL LEAD BETA RESORCYLATE AND MONOBASIC CUPRIC SALICYLATE

Thomas E. Dunigan, Oak Ridge, and George C. Sisco, Budd Lake, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 78,954, Oct. 7, 1970. This application Feb. 18, 1972, Ser. No. 226,580
Int. Cl.² C07F 7/24
U.S. Cl. 260—435 R 1 Claim

1. An organo-metallic complex consisting essentially of the residue product of the interacting of 15–85% by weight of normal lead beta resorcylate and 85–15% by weight of monobasic cupric salicylate in a solvent medium of the group consisting of water and an alcohol and mixtures thereof at an elevated temperature of at least about 180° F.

4,001,288

MAGNETIC ORGANO-IRON COMPOUNDS

Howard S. Gable, Kansas City, and Glenn W. Kerr, Mission, both of Kans., assignors to Howard S. Gable, Kansas City, Mo.

Continuation-in-part of Ser. No. 487,565, Sept. 15, 1965. This application Apr. 16, 1970, Ser. No. 29,008
Int. Cl.² C07F 15/02
U.S. Cl. 260—439 R 21 Claims

1. A process for preparing a water soluble organo-iron compound exhibiting strongly ferromagnetic properties both in the dry state and in aqueous solution, including the steps which comprise:

a. combining ferrous and ferric ions in approximately the stoichiometric ratio of one molar part ferrous to two of ferric in an alkaline solution to form a precipitate in situ, said precipitate (after drying) having an X-ray diffraction pattern essentially the same as that of magnetite,

b. reacting the preciptitate with a hydroxy-carboxylic acid to form an alkali-soluble complex, said reaction being effected under conditions to preserve the magnetite-like crystalline structure, and

c. solubilizing said complex with an alkaline material.

4,001,289

ALCOHOL-RHODIUM SEPARATION PROCESS

Steven J. Dougherty, St. Albans, and Rex C. Wells, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 17, 1974, Ser. No. 506,864
Int. Cl.² C07C 27/06, 27/26
U.S. Cl. 260—450 4 Claims

1. In the extraction process of separating the alcohol products, including ethylene glycol, of the high pressure production solvent containing, homogeneous liquid phase reaction between oxides of carbon and hydrogen in the presence of a rhodium carbonyl complex catalyst, whereby the alcohol products of the reaction and rhodium from said catalyst are in solution in said production solvent, the improvement which comprises mixing said solution with water and an organic extraction solvent in which said production solvent is more soluble than it is in water, which extraction solvent is characterized as being liquid under the conditions of the extraction, it is essentially immiscible in water, it is essentially non-reactive with water and the alcohol products, the extraction solvent being further characterized in the formation of two layers (one principably containing water and the ethylene glycol and the other principally containing the extraction solvent and the rhodium content which was in the production solution) when it is intermixed at 25° C with an equal volume of water and blended at 25° C with an equal volume of production solution, whereby said products are separated into an aqueous phase and the catalyst is separated into the extraction solvent phase.

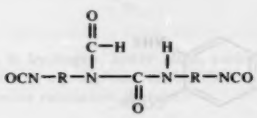
4,001,290

ORGANIC ISOCYANATE COMPOSITIONS AND PRODUCTION THEREOF

Kuno Wagner, Leverkusen, and Rudolf Braden, Odenthal-Scheuren, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 12, 1969, Ser. No. 806,695
Claims priority, application Germany, Mar. 15, 1968, 1668115
Int. Cl.² C07C 119/042, 119/045, 119/048
U.S. Cl. 260—453 A 9 Claims

1. N,-formyl-N,N′-disubstituted diisocyanato urea having the formula:



wherein R is the organic radical remaining after the removal of the isocyanato groups from an organic diisocyanate selected from the group consisting of aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanates.

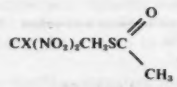
4,001,291

2,2,2-FLUORODINITROETHANETHIOL AND METHOD OF PREPARATION

Horst G. Adolph, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

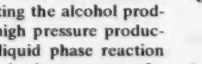
Filed Mar. 11, 1976, Ser. No. 666,103
Int. Cl.² C07C 153/09, 149/16, 149/20; C06B 25/00
U.S. Cl. 260—455 R 15 Claims

1. A compound of the formula



wherein X is selected from the group consisting of nitro, fluoro, chloro, bromo, and lower alkyl of from 1 to 4 carbon atoms.

8. A compound of the formula



wherein X is selected from the group consisting of nitro, fluoro, chloro, bromo, and lower alkyl of from 1 to 4 carbon atoms.

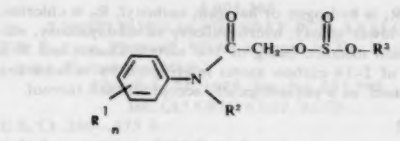
4,001,292

SULFITES OF AROMATIC GLYCOLIC AMIDES

Adolf Fischer, Mutterstadt; Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 1, 1974, Ser. No. 484,419
Claims priority, application Germany, July 7, 1973, 2334715
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² C07C 137/00
U.S. Cl. 260—456 NS 4 Claims

1. A sulfite of an aromatic glycolic amide of the formula



wherein R^1 is hydrogen or alkyl of 1 to 3 carbon atoms, n is one of the integers 0, 1, 2, 3 and 4, R^2 is alkyl of 1 to 4 carbon atoms, and R^3 is alkyl of up to 6 carbon atoms.

4,001,293

PROCESS FOR PRODUCTION OF γ-HALONITRILES

James H. Plonka, and Ralph A. Davis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1975, Ser. No. 564,252

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C *120/04*

U.S. Cl. 260—465.7 **14 Claims**

1. A process for the preparation of γ-halonitriles comprising reacting by contacting a 1,3-dihalopropane wherein the halogens are chlorine, bromine, or iodine, with an alkali metal cyanide in the presence of at least 0.3 moles of an alkali metal halide wherein the halide is chlorine, bromine, or iodine, per mole of the 1,3-dihalopropane, sufficient water to dissolve the inorganic salts, and a catalytic amount of an onium salt selected from the group consisting of a quaternary ammonium salt, a quaternary phosphonium salt, and a tertiary sulfonium salt.

4,001,294

METHOD OF PREPARING UNSATURATED DINITRILES

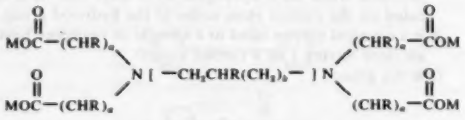
Charles A. Drake, and Stanley J. Marwil, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 20, 1975, Ser. No. 624,023

Int. Cl.² C07C *120/00, 121/20*

U.S. Cl. 260—465.8 R **17 Claims**

1. A method for inhibiting the formation of 5-methyl-4-hexenenitrile during the preparation of mixed, isomeric C_{10} unsaturated dinitriles by the twofold addition of acrylonitrile to isobutylene under reaction conditions suitable for producing said isomeric C_{10} unsaturated dinitriles comprising providing that the reaction mixture contain, at a point in the reaction where 5-methyl-4-hexenenitrile is found to form, in an amount sufficient to inhibit the formation of 5-methyl-4-hexenenitrile, an alkali metal salt of the formula



wherein

each M is individually selected from the group consisting of hydrogen and an alkali metal such that at least one M is an alkali metal atom,

each R is individually selected from the group consisting of hydrogen, methyl, and ethyl such that the total number of carbon atoms per molecule is in the range of 10 to 21,

a is an integer of value 1 or 2, and

b is an integer of value 0 or 1.

4,001,295

11,12-DIFLUOROMETHYLENE SUBSTITUTED PROSTANOIC AND PROST-5-CIS-ENOIC ACID DERIVATIVES

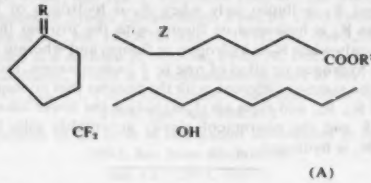
Joseph M. Muchowki, Mexico City, Mexico, and John H. Fried, Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 23, 1975, Ser. No. 589,219

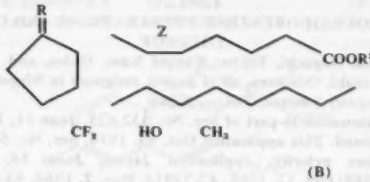
Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **38 Claims**

1. A racemic or antimeric compound selected from the group of those represented by the formulas:



(A)



(B)

wherein

R is a keto group or α-hydroxy-β-hydrogen;

R^2 is hydrogen, a lower alkyl group or the non-toxic, pharmaceutically acceptable salts of compounds in which R^2 is hydrogen;

Z is a saturated linkage or a cis double bond and the wavy lines ( ) indicate the α or β configuration or mixtures thereof, provided that when the side chain attached at the C-12 position is β, the difluoromethylene group at the C-11,12 positions is 11α,12α only, and when the side chain attached at the C-12 position is α, the difluoromethylene group at the C-11,12 positions is 11β,12β only.

4,001,296

5-OXA PROSTAGLANDIN E_1 ANALOGS

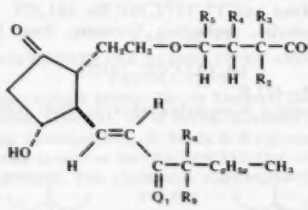
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 361,991, May 21, 1973, Pat. No. 3,931,279. This application Dec. 6, 1974, Ser. No. 530,087

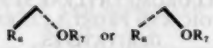
Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **15 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein C_eH_{2e} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_8R_9— and terminal methyl; wherein Q_1 is



wherein R_6 and R_7 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_3, R_8, and R_9 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different with the proviso that R_9 is fluoro only when R_8 is hydrogen or fluoro; wherein R_2 is hydrogen or fluoro, with the proviso tht R_2 is fluoro only when R_3 is hydrogen or fluoro; and wherein R_4 and R_5 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R_3, R_4, and R_5 is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,001,297

THIOUREIDOBENZENE PREPARATIONS AND USES THEREOF

Teruhisa Noguchi, Tokyo; Kimpei Kato, Ohiso, and Koshin Miyazaki, Odawara, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

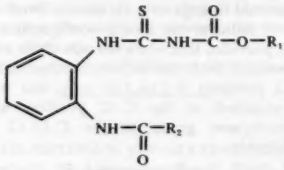
Continuation-in-part of Ser. No. 832,425, June 11, 1969, abandoned. This application Oct. 15, 1974, Ser. No. 514,453

Claims priority, application Japan, June 18, 1968, 43-41588; Oct. 12, 1968, 43-73914; Nov. 2, 1968, 43-79655; Nov. 5, 1968, 43-80379; Nov. 18, 1968, 43-83999; Dec. 9, 1968, 43-89523

Int. Cl.² C07C *149/40*

U.S. Cl. 260—470 **3 Claims**

1. A compound of the formula



wherein R_1 is alkyl of 1 through 4 carbon atoms; R_2 is cyclopropyl or phenyl.

4,001,298

TRIIODIZED N-METHYLDICARBOXYLIC ACID ANILIDES

Heinz Gries, and Heinrich Pfeiffer, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

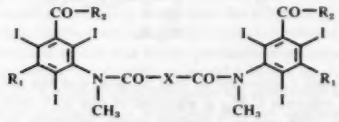
Filed Aug. 17, 1972, Ser. No. 281,379

Claims priority, application Germany, Aug. 17, 1971, 2141803

Int. Cl.² C07C *101/50*

U.S. Cl. 260—471 R **14 Claims**

1. A triiodized N-methyldicarboxylic acid anilide of the formula



wherein R_1 is hydrogen or halogen, carboxyl, R_2 is chlorine, hydroxy, lower alkoxy, hydroxyalkoxy or alkoxyalkoxy, alkoxy in each instance being of 1–6 carbon atoms; and X is alkylene of 2–14 carbon atoms interrupted by at least one oxygen atom, or a physiologically acceptable salt thereof.

4,001,299

HINDERED HYDROXYPHENYLALKANOATES OF SUBSTITUTED ISOPROPANOLS

Martin Dexter, Briarcliff Manor, and David Herbert Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

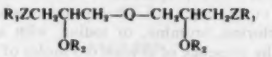
Filed Dec. 12, 1974, Ser. No. 532,140

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C *149/20, 69/76*

U.S. Cl. 260—473 S **4 Claims**

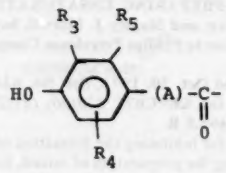
1. A compound having the formula



wherein

R_1 is alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkylthioethyl of 4 to 27 atoms in the chain or alkylpolyoxyalkylene of 4 to 27 atoms in the chain having the general structure $R°(OC_nH_{2n})_h$ or $R°(OCH_2CHR')_h$ where R° is alkyl of 1 to 18 carbon atoms, n is 2 to 4, R′ is hydrogen, methyl or ethyl and h is 1 to 3,

R_2 is the group



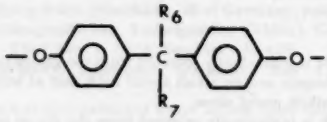
R_3 is hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms or α-methylbenzyl,

R_4 is alkyl of 1 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms,

R_5 is hydrogen or lower alkyl of 1 to 4 carbon atoms or R_3 and R_5 together are a butylene chain which, together with the phenyl ring, form a tetrahydronaphthyl group, and provided when R_3 is hydrogen, R_5 is alkyl and R_4 is located on the carbon atom ortho to the hydroxyl group,

A is a covalent carbon bond or a straight or branched lower alkylene having 1 to 8 carbon atoms,

Q is the group



R_6 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_7 is hydrogen or alkyl of 1 to 8 carbon atoms, and

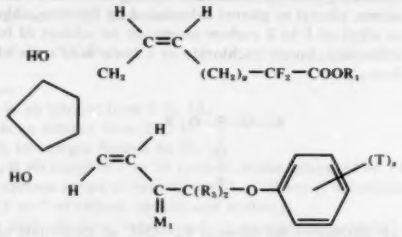
Z is oxygen or sulfur.

4,001,300
2,2-DIFLUORO-16-PHENOXY-PGF$_2$ ANALOGS

Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 24, 1975, Ser. No. 552,708
Int. Cl.[2] C07C 65/22, 61/76
U.S. Cl. 260—473 A 58 Claims

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein g is 2 to 4, inclusive;

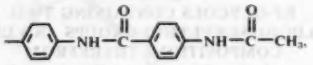
wherein M_1 is

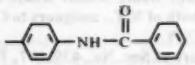
or

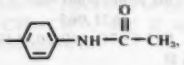
wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

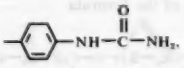
wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_4$ wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl;

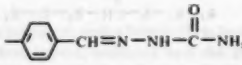
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.











-continued

; and

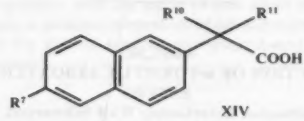
wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,001,301
6-SUBSTITUTED 2-NAPHTHYL ACETIC ACID DERIVATIVES

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama City, Panama

Division of Ser. No. 195,878, Nov. 4, 1971, Pat. No. 3,896,157, which is a division of Ser. No. 694,771, Dec. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 608,997, Jan. 13, 1967, abandoned. This application Mar. 17, 1975, Ser. No. 558,874
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.[2] C07C 69/76
U.S. Cl. 260—473 F 10 Claims

1. The compounds of the formula:



XIV

wherein:

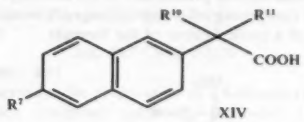
R^7 is alkoxy having 1 to 6 carbon atoms

one of R^{10} and R^{11} is hydrogen, the other being methyl or ethyl;

the alkyl esters of the compounds of Formula XIV derived from alkonols having 1 to 12 carbon atoms; and

the pharmaceutically acceptable addition salts thereof.

5. The compounds of the formula:



XIV

wherein:

R^7 is alkylthio having 1 to 6 carbon atoms;

one of R^{10} and R^{11} is hydrogen, the other being methyl or ethyl;

the alkyl esters of the compounds of Formula XIV derived from alkanols having 1 to 12 carbon atoms; and

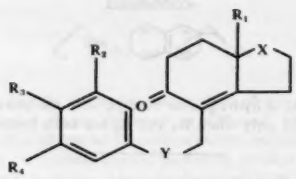
the pharmaceutically acceptable addition salts thereof.

4,001,302
9,10-SECOESTRANE DERIVATIVES AND THEIR PRODUCTION

Ulrich Eder; Gregor Haffer; Jürgen Ruppert; Gerhard Sauer, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Continuation-in-part of Ser. No. 409,235, Oct. 24, 1973, Pat. No. 3,890,391. This application Apr. 21, 1975, Ser. No. 570,091
Claims priority, application Germany, Oct. 25, 1972, 2253089
Int. Cl.[2] C07C 69/02
U.S. Cl. 260—479 R 4 Claims

1. A 9,10-secoestrane of the formula



wherein R_1 is methyl or ethyl; R_2 and R_3 each is a hydrogen atom or alkoxy of 1–4 carbon atoms; R_4 is a hydrogen atom, alkoxy of 1–4 carbon atoms, or hydrocarboncarbonyloxy of 1–12 carbon atoms; X is carbonyl, dialkoxymethylene wherein the alkoxy groups each contain 1–4 carbon atoms, hydroxymethylene, alkoxymethylene wherein the alkoxy group contains 1–10 carbon atoms, or aralkoxymethylene wherein the aralkoxy group contains 7–10 carbon atoms, or hydrocarboncarbonyloxymethylene wherein the hydrocarboncarbonyloxy group contains 1–10 carbon atoms, and Y is carbonyl or dialkoxy methylene, provided that R_4 is hydrocarboncarbonyloxy when X is other than hydrocarbon-carbonyloxymethylene.

4,001,303

PRODUCTION OF ω-FORMYL CARBOXYLIC ACID ESTERS

Helmut Waldmann, Leverkusen; Wulf Schwerdtel, Leverkusen-Steinbuechel, and Wolfgang Swodenk, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 26, 1973, Ser. No. 410,074

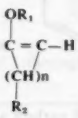
Claims priority, application Germany, Oct. 27, 1972, 2252780

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07C *67/00*

U.S. Cl. 260—483 **11 Claims**

1. A process for the production of an ω-formyl carboxylic acid ester, comprising reacting hydrogen peroxide with an enol ether of a cyclic ketone of the formula

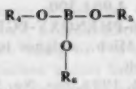


wherein

R_1 is alkyl of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms substituted by fluorine, chlorine, alkoxy of 1 to 3 carbon atoms, cyano or phenyl,

n is an integer of about 3 to 10, and R_2 each independently is hydrogen, fluorine, chlorine, cyano, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 6 carbon atoms, alkyl of 1 to 6 carbon atoms substituted by fluorine, chlorine, cyano or alkoxy of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms substituted by fluorine, chlorine, cyano, alkoxy of 1 to 4 carbon atoms or alkyl of 1 to 6 carbon atoms,

in the presence of a catalyst consisting essentially of a member selected from the group consisting of a compound of boron, a compound of boron plus a compound of a metal of the Fifth Secondary Group of the Periodic Table, and a compound of boron plus a compound of a metal of the Sixth Secondary Group of the Periodic Table, said compound of boron being selected from the group consisting of a boron oxide, a boric acid, a salt of a boric acid, boron trifluoride, boron trichloride, a boric acid ester of the formula



wherein

R_4, R_5 and R_6 each independently is alkyl of 1 to 6 carbon atoms, alkyl of 1 to about 6 carbon atoms substituted by hydroxyl, fluorine, chlorine, alkoxy of 1 to 3 carbon atoms, phenyl or phenyl substituted by fluorine, chlorine or alkyl of 1 to 3 carbon atoms, or an adduct of boron trifluoride, boron trichloride or a boric acid ester of the formula

with an alcohol of the formula R_4—OH, an alcoholate of the formula R_4—OMe, a carboxylic acid of the formula R_4—COOH, an ether of the formula R_4—O—R_5 or a hydrogen halide, wherein Me is an alkali or alkaline earth metal, zinc or aluminum, said compound of a metal of the Fifth or Sixth Secondary Group of the Periodic Table being selected from the group consisting of a carboxylate, carbonyl, nitrosocarbonyl, acetonate and acetylacetonate at a temperature of −80° to +30°C.

4,001,304

ACRYLIC ACID ESTERS

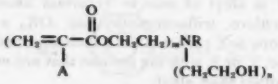
Kayson Nyi, Sellersville, and Sandra I. Graham, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 2, 1974, Ser. No. 466,353

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 R **3 Claims**

1. A compound of the formula:



wherein A is hydrogen or methyl; R is a radical of the formula $-CH_2CH_2X$ wherein X is, hydroxy or nitro; m is a number having a value in the range of 1 to 2 and n is a number having a value in the range of 0 to 1.

4,001,305

RF-GLYCOLS CONTAINING TWO PERFLUOROALKYLTHIO GROUPS AND USEFUL COMPOSITIONS THEREFROM

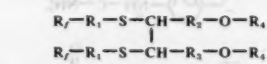
Robert Ernest Arthur Dear, Mount Kisco, and Robert Allan Falk, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 439,497, Feb. 4, 1974, Pat. No. 3,935,277. This application Nov. 12, 1975, Ser. No. 631,005

Int. Cl.² C07C *149/20*, *149/40*

U.S. Cl. 260—486 H **12 Claims**

1. A compound of the formula



in which

R_f is straight or branched-chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;

R_1 is branched or straight chain alkylene of 1 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, or alkyleneoxyalkylene of 2 to 12 carbon atoms;

R_2 and R_3 each independently is straight or branched chain alkylene of 1 to 12 carbon atoms; straight or branched chain alkylene of 1 to 12 carbon atoms, substituted by one or two of phenyl or cyclohexyl; or R_2 and R_3 are a group of the formula

$$C_mH_{2m}(OC_kH_{2k})_r$$

where

m is an integer from 1 to 12,

k is an integer from 2 to 6,

r is an integer from 1 to 40

R_4 is alkanoyl of 1 to 24 carbon atoms, alkenoyl of 1 to 24 carbon atoms or said alkanoyl or alkenoyl substituted by 1 to 3 of chloro, bromo and carboxyl,

or said alkanoyl substituted by phenyl or naphthyl, said phenyl or naphthyl being unsubstituted or substituted by 1 to 3 of chloro, bromo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms,

or said alkanoyl substituted by lower acyl or lower acylamino where lower acyl means alkanoyl or alkenoyl of 2 to 6 carbon atoms and the mono- or di-chloro or bromo derivative thereof;

or R_4 is benzoyl or benzoyl substituted by 1 to 3 of chloro, bromo, alkyl of 1 to 18 carbon atoms, alkoxy of 1 to 8 carbon atoms or lower acyl or lower acylamino where lower acyl means alkanoyl or alkenoyl of 2 to 6 carbon atoms, and the mono- or di-chloro or bromo derivative thereof.

4,001,306

PROSTAGLANDIN $F_{2\alpha}$ 15-MONOACRYLATES

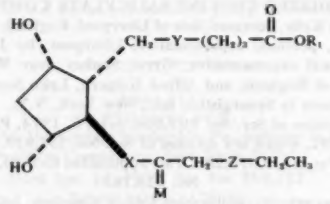
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 214,472, Dec. 30, 1971, abandoned. This application Jan. 30, 1975, Ser. No. 545,366

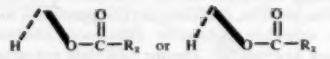
Int. Cl.² C07C *177/00*

U.S. Cl. 260—488 R **3 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein (a) X is trans—CH=CH— or $—CH_2CH_2—$, and Y and Z are both $—CH_2CH_2—$, or (b) X is trans—CH=CH—, Y is cis—CH=CH—, and Z is $—CH_2CH_2—$ or cis —CH=CH —; wherein M is



wherein R_2 is n-propyl; and wherein R_1 is hydrogen or alkyl of one to 8 carbon atoms, inclusive and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,001,307

PREPARATION OF HALOESTERS FROM DIENES

Carlos G. Cardenas, Jacksonville, Fla., assignor to SCM Corporation, New York, N.Y.

Filed May 10, 1973, Ser. No. 359,011

Int. Cl.² C07C *67/10*

U.S. Cl. 260—491 **8 Claims**

1. A process for the preparation of 4-halo-3-methylbut-2-enyl lower fatty acid esters from isoprene comprising the steps of;

a. halogenating isoprene in the presence of at least about 0.05 mols per mol of isoprene of a dipolar aprotic solvent selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, acetamide, N-methylpyrrolidine, hexamethyl phosphoramide, and dimethylsulfoxide under halogenation conditions with elemental halogen to produce a reaction mixture a predominant portion of which is 1,4-dihalo-2-methyl-2-butene;

b. esterifying the reaction mixture of step (a) in an esterification reaction under esterification reaction conditions with an alkali metal salt of a lower fatty acid, the esterification reaction being carried out in the presence of a catalyst consisting essentially of an amine or phosphine at a temperature in the range of about −100° to 300° C, the amount of alkali metal salt employed being the amount stoichiometrically necessary to replace the halogen ion in the 1-position with the anion of said alkali metal salt to produce a product mixture of which a predominant portion is the desired 4-halo-3-methylbut-2-enyl lower fatty acid ester.

4,001,308

PROCESS FOR THE PREPARATION OF 1,4-DIACETOXYCYCLOPENT-2-ENE

Seizi Kurozumi; Takeshi Toru; Toshio Tanaka; Shuzi Miura; Makiko Kobayashi, all of Hino, and Sachio Ishimoto, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 13, 1974, Ser. No. 532,616

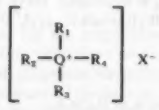
Claims priority, application Japan, Dec. 19, 1973, 48-141180

Int. Cl.² C07C *67/10*

U.S. Cl. 260—491 **10 Claims**

1. A process for the preparation of 1,4-diacetoxycyclopent-2-ene, which comprises contacting a solution (A) of 1,4-dibromocyclopent-2-ene in an inert organic solvent which is slightly soluble or insoluble in water, with an aqueous solution or suspension (B) of at least one metal salt of acetic acid which is at least partially water soluble, in the presence of a cationic surface active compound which is substantially insoluble both in the solution (A) and the aqueous solution or suspension (B), and is selected from the group consisting of

1. nitrogen-containing or phosphorus-containing quaternary organic compounds of the formula:



(I)

in which Q stands for nitrogen or phosphorus atom, R_1, R_2, R_3, and R_4 may be different or same, each denoting a hydrocarbon group, and X^- stands for a halogen ion, and

2. alkylamine salts selected from the group consisting of laurylamine acetate and octadecylamine acetate.

4,001,309
METHOD OF PREPARING POLYFLUOROALKYL GROUP CONTAINING COMPOUNDS

Takao Hayashi, and Masashi Matsuo, both of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1973, Ser. No. 351,455

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.[2] C07C *27/00, 29/00, 67/20*

U.S. Cl. 260—493 **12 Claims**

1. A method of preparing perfluoroalkyl group containing compounds which comprises reacting a polyfluoroalkyl halide having the formula $R_fCH_2CH_2X$, wherein R_f represents a perfluoroalkyl group containing 1–23 carbon atoms and X represents a bromine atom or an iodine atom, with water and an amide having the formula $RCONR'R''$, wherein R, R' and R'' represent hydrogen atoms or lower alkyl groups under conditions in which the mole ratio of water to said polyfluoroalkyl halide is in the range from 1 : 1 to 10 : 1 and the ratio of said amide to said polyfluoroalkyl halide is at least 1 : 1 at a temperature from about 80° to 200°C.

4,001,310
POLYETHERS HAVING OXIDIZED THIOETHER SIDE CHAINS

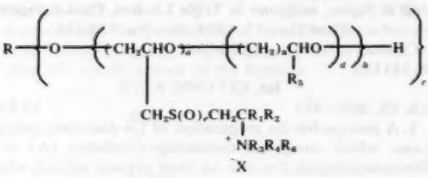
Hugh A. Farber, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 427,607, Dec. 26, 1973, Pat. No. 3,917,697, which is a division of Ser. No. 846,929, Aug. 1, 1969, Pat. No. 3,821,306. This application Sept. 15, 1975, Ser. No. 613,150

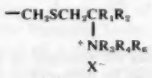
Int. Cl.[2] C07C *87/30*

U.S. Cl. 260—501.15 **9 Claims**

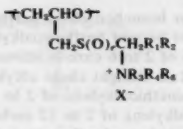
1. The polyether represented by the formula:



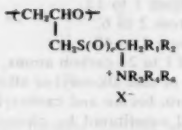
wherein R is hydrogen or the residue of an organic active hydrogen activator selected from the group consisting of aliphatic monohydric alcohols, aliphatic polyhydric alcohols, hydroxyl terminated polyalkylene polyethers and haloalkyl alcohols; R_1 and R_2 are individually hydrogen, alkyl, alkoxy, poly(alkyleneoxy) alkyl, poly(alkylenethio) alkyl, hydroxyalkyl, aryl, aralkyl, cycloalkyl or aryloxy; R_3, R_4 and R_6 are individually alkyl, hydroxyalkyl, alkoxyalkyl, poly(alkyleneimino)alkylamine, aryl, aralkyl, alkenyl, alkoxyaryl, aryloxyaryl, aryloxyalkyl, or cycloalkyl; X is an anion common to ammonium salts; R_5 is hydrogen, alkyl, haloalkyl, mercaptoalkyl, alkoxyalkyl, alkylthioalkyl, aryl, aryloxyalkyl or



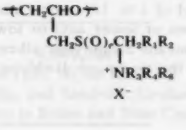
a is a positive number sufficient to provide repeating units of



and *d* is 0 or a positive number with the proviso that the ratio of *a* to *d* is such that the polyether contains at least 10 mole percent of



b is a positive integer; *c* is a positive integer 1 to 8 and *n* is a positive integer from 1 to 4, *e* of each



is 1 or 2; said polymer having a molecular weight in the range from about 300 up to about 2 million.

4,001,311
STABILIZED CHOLINE SALICYLATE COMPOUNDS

William Kelly, deceased, late of Liverpool, England; by Monica Kelly, personal representative, Liverpool; by John Kelly, personal representative, Great Sankey near Warrington, both of England, and Alfred Halpern, Lake Success, N.Y., assignors to Synergistics, Inc., New York, N.Y.

Division of Ser. No. 501,004, Sept. 3, 1974, Pat. No. 3,947,491, which is a division of Ser. No. 237,927, March 24, 1972, Pat. No. 3,855,282. This application Oct. 24, 1975, Ser. No. 625,783

Claims priority, application United Kingdom, July 24, 1971, 34941/71

Int. Cl.[2] C07C *91/26*

U.S. Cl. 260—501.15 **16 Claims**

1. A choline salicylate sulfite-containing compound selected from the group consisting of choline salicylate sodium bisulfite, choline salicylate sodium metabisulfite, choline salicylate sodium dithionate, choline salicylate sodium hydrosulfite, choline salicylate sodium hyposulfite, choline salicylate potassium bisulfite, choline salicylate potassium metabisulfite, choline salicylate potassium dithionate, choline salicylate potassium hydrosulfite, choline salicylate potassium hyposulfite, choline salicylate lithium bisulfite, choline salicylate lithium metabisulfite, choline salicylate lithium dithionate, choline salicylate lithiumhydrosulfite and choline salicylate lithium hyposulfite.

4,001,312

AMINOALCOHOLS

Masaru Nakao; Kikuo Sasajima, both of Toyonaka; Isamu Maruyama, Minoo; Shigenari Katayama, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 203,002, Nov. 29, 1971, abandoned. This application Aug. 14, 1974, Ser. No. 497,389

Claims priority, application Japan, Dec. 9, 1970, 45-109767

Int. Cl.² C07C *91/28*

U.S. Cl. 260—501.18 4 Claims

1. 4-[2-(2-Ethoxyphenoxy)ethylamino]-1-(4-fluorophenyl)-1-butanol and its pharmaceutically acceptable acid addition salt.

4,001,313

MANUFACTURE OF AROMATIC AMINO COMPOUNDS

Osamu Manabe, and Kenichi Nara, both of Osaka, Japan, assignors to Osaka City, Osaka, Japan

Continuation of Ser. No. 210,215, Dec. 20, 1971, abandoned. This application Sept. 26, 1974, Ser. No. 509,631

Claims priority, application Japan, Dec. 29, 1970, 45-127299

Int. Cl.² C07C *143/56*, *85/02*, *101/44*

U.S. Cl. 260—508 8 Claims

1. A process for producing an aromatic amine which comprises heating an aromatic sulfonate having a formula of

$$A - (SO_3Z)_n$$

wherein Z is selected from the group consisting of alkali metals, alkaline earth metals and ammonium, *n* is an integer of 1 to 4 and A is a benzene, naphthalene, anthracene or pyrene ring having or not having 1 to 5 substituents, said substituent being an alkyl of 1 to 4 carbon atoms, aminoalkyl of 1 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, phenylalkyl of 7 to 10 carbon atoms, phenyl, alkylphenyl of 7 to 13 carbon atoms, carboxyl, carbonamide, amino, hydroxyl or styryl, and a metal amide selected from the group consisting of alkali metal amide and alkaline earth metal amide in liquid ammonia in a closed reactor at a temperature of 70° to 200° C to produce a metal arylamide, removing ammonia from the reaction mixture, reacting the resultant metal arylamide with water or lower alkanol of 1 to 3 carbon atoms to produce an aromatic amine and separating the aromatic amine thus produced from the reaction mixture, said metal amide being used in an amount of about 2.1 to 3.6 moles per sulfonyl group of said aromatic sulfonate.

4,001,314

15-ETHYNYL-PGE,

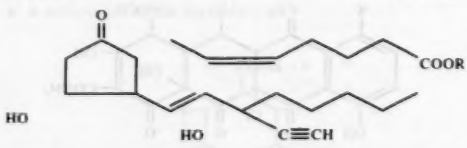
George E. M. Husbands, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 568,212

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D 2 Claims

1. A compound of the formula:



wherein R is hydrogen, alkyl of from 1 up to about 6 carbon atoms, alkali metal, or a pharmacologically acceptable cation derived from ammonia or a basic amine.

4,001,315

PROSTAGLANDIN DERIVATIVES

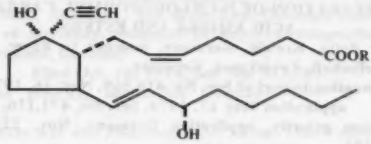
Donald P. Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 505,802, Sept. 13, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 621,452

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D 4 Claims

1. A chemical compound of the structure:



wherein R is hydrogen or alkyl of from 1 to 6 carbon atoms.

4,001,316

METHOD FOR MANUFACTURE OF METHACRYLIC ACID

Kazuo Ishimi, Takasaki, Japan, assignor to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 481,255, June 20, 1974, Pat. No. 3,956,182. This application Mar. 17, 1975, Ser. No. 558,939

Claims priority, application Japan, June 30, 1973, 48-74014; Dec. 14, 1973, 48-138691; Feb. 21, 1974, 49-19933

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N 6 Claims

1. A method for the manufacture of methacrylic acid comprising: providing a catalyst having the following composition:

$$Mo_aP_bSb_cZn_dX_eO_f(NH_4)_g$$

wherein, X denotes at least one element selected from the group consisting of chromium, tungsten, iron, cobalt, nickel, copper, tin, manganese, vanadium and bismuth, the subscripts *a*, *b*, *c*, *d*, *e*, and *f* respectively denote the numbers of molybdenum, phosphorus, antimony, zinc, X and oxygen atoms, the subscript g denotes the number of ammonium groups, with the proviso that the elements are present in a ratio so that *a* is 12, *b* is 0.8 to 6, *c* is 0.1 to 7, *d* is less than 4 but not 0, *e* is 0 to 6 and *g* is 0 to 3.5 and *f* is 38 to 81; and

contacting said catalyst with a gaseous feed comprising methacrolein and molecular oxygen or a molecular oxygen-containing gas to effect oxidation of the methacrolein in the vapor phase.

4,001,317

PROCESS FOR THE OXIDATION OF OLEFINS USING CATALYSTS CONTAINING VARIOUS PROMOTER ELEMENTS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed July 22, 1974, Ser. No. 490,428

Int. Cl.² C07C *51/32*, *45/04*

U.S. Cl. 260—533 N 5 Claims

1. In the process for the preparation of unsaturated aldehydes and acids from propylene or isobutylene by the vapor phase oxidation of propylene or isobutylene with molecular oxygen at a temperature of about 200° to 600° C. in the presence of a catalyst, the improvement comprising using as the catalyst a catalyst of the formula

$$Ce_a A_b D_c E_d Fe_f Bi_h Mo_{12} O_x$$

wherein

A is an alkali metal, Tl or mixture thereof;

D is Ni, Co, Mg, Zn, Cd, Ca, Sr or mixture thereof;
E is P, As, B, S, Al or mixture thereof;
and wherein
a is greater than 0 but less than 5;
b and *d* are 0–4;
c, *f* and *g* are 0.1–12; and
x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,001,318
PREPARATION OF N-CHLOROFORMYL-CARBAMIC ACID AMIDES AND ESTERS

Artur Botta, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 416,569, Nov. 16, 1973. This application May 17, 1974, Ser. No. 471,116
Claims priority, application Germany, Nov. 22, 1972, 2257344
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² C07C *127/19*
U.S. Cl. 260—544 C **2 Claims**

1. The compound N-chloroformyl - N-phenyl-N'-(β-chloroethyl)-N'-methylurea.

4,001,319
PROCESS FOR THE PREPARATION OF CARBACYL HALOSULFATES

David C. England, and Carl G. Krespan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 7, 1973, Ser. No. 357,526
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² C07F *143/70*
U.S. Cl. 260—545 R **1 Claim**

1. Method of making carbacyl fluorosulfates which comprises contacting and reacting trifluoroacetyl fluoride with sulfur trioxide at −30°C to 100°C.

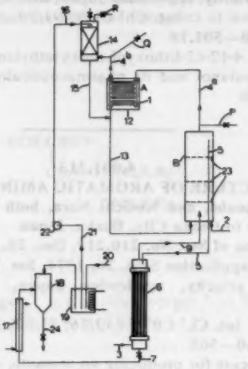
4,001,320
METHOD FOR CONTROLLING THE AMMONIA AND CO_2 RATIOS IN A UREA MANUFACTURING PROCESS

Petrus J. C. Kaasenbrood, Sittard, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 41,163, May 25, 1970, abandoned, which is a continuation of Ser. No. 631,335, April 17, 1967, abandoned, which is a continuation-in-part of Ser. No. 531,833, March 4, 1966, Pat. No. 3,356,723, which is a continuation-in-part of Ser. No. 100,339, April 13, 1961, abandoned. This application May 13, 1975, Ser. No. 577,015
Claims priority, application Netherlands, Apr. 22, 1966, 6605483
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 A **2 Claims**

1. In continuous processes for producing urea which comprise (1) reacting NH_3 and CO_2 at a pressure of 100–140 atm. and a temperature of 155°–170° C to form initially an ammonium carbamate solution (2) subsequently converting said solution at a pressure of 100–140 atm. and a temperature of 170°–190° C into a urea solution which contains ammonium carbamate and/or dissolved NH_3 and CO_2, (3) thereafter stripping the said urea solution with a member selected from the group consisting of NH_3, CO_2 and mixtures thereof, whereby a large part of the unreacted NH_3 and CO_2 and the additional NH_3 and CO_2 from the decomposition of the unconverted ammonium carbamate present in said solution is removed therefrom in the gaseous state, (4) feeding the stripped NH_3 and CO_2 to the ammonium carbamate-formation zone or the urea-formation zone, (5) expanding the resulting urea solution to a low pressure to effect further removal of still dissolved NH_3 and CO_2, (6) removing the urea solution freed of dissolved NH_3 and CO_2 for further processing,

the improvement wherein there is maintained (a) in the ammonium carbamate-formation zone a value of from 2:1 to 3:1 for the NH_3/CO_2 molar ratio of the NH_3 and CO_2 bonded otherwise than in the form of urea and biuret, and (b) in the urea-formation zone, a value of from 3:1 to 6:1 for the NH_3/CO_2 molar ratio of the NH_3 and CO_2 present in the liquid phase as such and as NH_3 and CO_2 bonded otherwise than in the form of urea and biuret, by continual sensing and analysis of the molar NH_3/CO_2 gas ratio in one of the gas phases that are in contact with the liquid phases in said respective zones, and controlling the supply of NH_3 and/or CO_2 so as to maintain the thus-sensed said gas ratio within the range of 1:1 to 6:1, whereby the said NH_3/CO_2 ratios in the respective said liquid phases, and the desired temperatures in the said respective zones are thereby maintained.

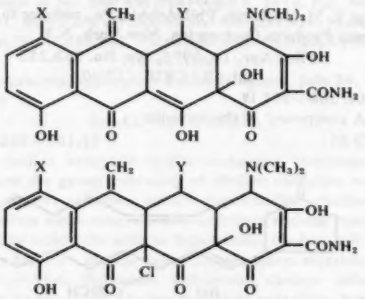


4,001,321
PREPARATION OF α-6-DEOXYTETRACYCLINES

Hermann Faubl, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 590,598, June 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 534,452, Dec. 19, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,714
Int. Cl.² C07C *103/19*
U.S. Cl. 260—559 AT **17 Claims**

1. A process which comprises introducing a catalytic amount of a compound of the formula $Rh(O\text{-}COR)_2(P[C_6H_5]_3)$ and a tetracycline compound selected from the group consisting of



and the acid-addition salts thereof into a reaction-inert solvent, and maintaining hydrogen in contact with the reaction mixture thus formed, at a temperature of from about 20° to

about 100° C., and at a pressure from about 1 to about 100 atmospheres until reaction of from about 1 to about 2 moles of hydrogen per mole of tetracycline compound occurs;

wherein R is selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, chloromethyl, dichloromethyl, trichloromethyl, fluoromethyl, difluromethyl, trifluoromethyl, phenyl, chlorophenyl, tolyl or anisyl;

X is selected from the group consisting of hydrogen and chloro;

and Y is selected from the group consisting of hydrogen, hydroxy and alkanoyl having from 2 to 7 carbon atoms.

4,001,322

3-SUBSTITUTED PHENYLALKYL AMINES

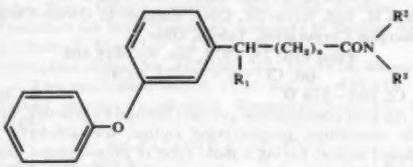
Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 536,769, Dec. 27, 1974, abandoned, which is a division of Ser. No. 380,038, July 17, 1973, Pat. No. 3,890,137, which is a division of Ser. No. 122,999, March 10, 1971, Pat. No. 3,972,934, which is a continuation-in-part of Ser. No. 828,756, May 28, 1969, Pat. No. 3,600,437, which is a continuation-in-part of Ser. No. 823,477, May 9, 1969, abandoned, and a continuation-in-part of Ser. No. 752,801, Aug. 15, 1968, abandoned. This application Nov. 14, 1975, Ser. No. 632,132

Int. Cl.² C07C *103/75, 101/00, 101/72*

U.S. Cl. 260—559 D **8 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, C_1 to C_5-alkyl, C_2 to C_5-alkenyl, C_5–C_5-alkynyl;

n is an integer of from 0 to 3;

each R_2 is the same or different and is hydrogen, C_1 to C_5-alkyl, or $-CH_2-COOR_3$, where R_3 is hydrogen, C_1 to C_5-alkyl, or a pharmaceutically acceptable cation;

and the pharmaceutically acceptable acid addition salts thereof.

4,001,323

WATER-SOLUBLE, NON-IONIZING HYDROXY-CONTAINING AMIDE DERIVATIVES OF 2,4,6-TRIIODO-ISOPHTHALIC ACID

Ernst Felder, Riva S. Vitale, Switzerland, and David E. Pitre, Milan, Italy, assignors to Savac AG, Chur, Switzerland

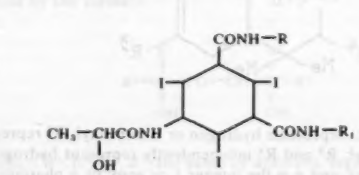
Filed Nov. 24, 1975, Ser. No. 634,836

Claims priority, application Switzerland, Dec. 13, 1974, 16588/74

Int. Cl.² C07C *103/26;* A61K *29/02*

U.S. Cl. 260—559 A **3 Claims**

1. A compound of the formula



wherein R and R_1 are members of the group consisting of 1,3-dihydroxyisopropyl and 2,3-dihydroxypropyl.

4,001,324

PROCESS FOR PRODUCING N-MONOSUBSTITUTED FORMAMIDES

Florin Seng, Schildgen, and Kurt Ley, Odenthal-Globusch, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 10, 1974, Ser. No. 513,781

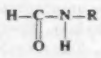
Claims priority, application Germany, Nov. 2, 1973, 2354717

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07C *103/02*

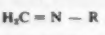
U.S. Cl. 260—561 R **7 Claims**

1. Process for producing an N-monosubstituted formamide having the formula:

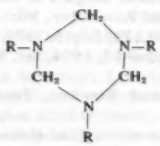


in which R is selected from the group of linear and branched alkyl having up to 18 carbon atoms, cycloalkyl having 4 to 12 carbon atoms, phenyl and naphthyl, the foregoing substituted by nitro, cyano, aryl or alkoxy, and aralkyl wherein the aromatic portion is phenyl or naphthyl and the alkyl portion has up to 8 carbon atoms;

which comprises reacting a formaldimine having the formula:



in which R is as defined above; or a hexahydrotriazine having the formula



in which R is as defined above, with hydrogen peroxide.

4,001,325

α-CHLOROACETANILIDE SELECTIVE HERBICIDES

Henry Bluestone, Beachwood; James A. Scozzie, Willoughby Hills, and Joseph A. Ignatoski, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 316,408, Dec. 18, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 413,379

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C07C *103/365*

U.S. Cl. 260—562 B **2 Claims**

1. 2-Chloro-2',6'-diethyl-N-propargylacetanilide.

2. 2-Chloro-2'-methyl-6'-ethyl-N-propargylacetanilide.

4,001,326

BENZOBICYCLOALKANE IMINES

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

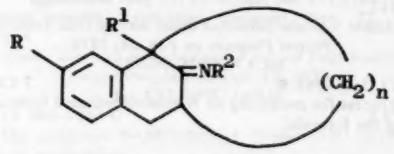
Division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,373

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07C 119/14

U.S. Cl. 260—566 R **12 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, lower alkyloxy, hydroxy, phenyl lower alkyloxy wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy, lower alkanoyloxy of from 2 to 7 carbon atoms, lower cycloalkanoyloxy, aromatic hydrocarbon carbonyloxy, halogen, or trifluoromethyl; R^1 is lower alkyl, lower alkenyl, or phenyl lower alkyl wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy; R^2 is hydrogen, lower alkyl, or phenyl lower alkyl wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy; and *n* is an integer from 3 to 5 inclusive.

4,001,327

NOVEL QUATERNARY SALTS AND METHOD

Benedict R. Lucchesi, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 269,128, July 5, 1972, Pat. No. 3,840,666. This application June 17, 1974, Ser. No. 480,114

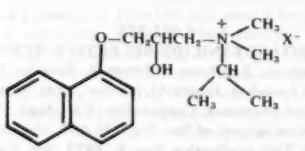
Claims priority, application United Kingdom, June 28, 1973, 30787/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C 91/26

U.S. Cl. 260—567.6 M **4 Claims**

1. A compound of the formula



wherein X^- is the anion of a pharmaceutically acceptable non-toxic acid.

4,001,328

DIARYLBUTANOLAMINES

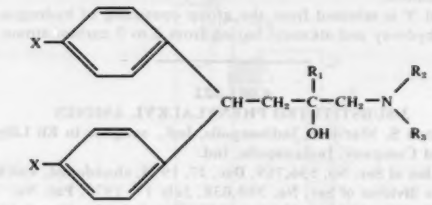
Bryan Barnet Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 4, 1975, Ser. No. 583,819

Int. Cl.² C07C 91/22, 91/26

U.S. Cl. 260—567.6 M **11 Claims**

1. The compound of the formula



wherein:

X is hydrogen or fluorine;

R_1 is hydrogen or C_1-C_3 alkyl;

R_2 and R_3 independently are hydrogen, C_1-C_6 alkyl, or $-CH_2R_4$, wherein R_4 is C_2-C_5 alkenyl; and the non-toxic pharmaceutically acceptable salts thereof.

4,001,329

ANILINE BASED REACTION PRODUCT

Reuben H. Bell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 25, 1974, Ser. No. 445,408

Int. Cl.² C07C 87/28, 91/40

U.S. Cl. 260—570 D **8 Claims**

1. An acid condensation product formed by reacting, under acidic conditions, propoxylated aniline, formaldehyde and diethanol amine, having a mole ratio of propoxylated aniline to formaldehyde to diethanol amine of 1 to 10: 1 to 8: 0.1 to 4, wherein the propoxylated aniline is a reaction product of propylene oxide and aniline.

4,001,330

AMINO ETHANOL-INDANE AND TETRAHYDRONAPHTHALENE DERIVATIVES

Adrian Charles Ward Curran, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed May 23, 1974, Ser. No. 472,760

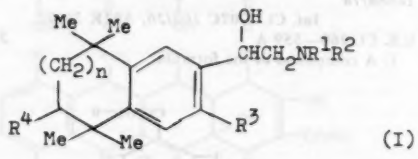
Claims priority, application United Kingdom, June 7, 1973, 27123/73

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C07C 91/22

U.S. Cl. 260—570.6 **4 Claims**

1. A compound having the formula:



(I)

wherein R^1 represents hydrogen or lower alkyl; R^2 represents lower alkyl; R^3 and R^4 independently represent hydrogen or lower alkyl; and *n* is the integer 1 or zero; or a pharmaceutically acceptable acid addition salt thereof.

4,001,331

BENZOBICYCLOALKANE

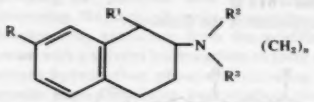
Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,375

Int. Cl.² C07C *41/02*

U.S. Cl. 260—571 24 Claims

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, lower alkyloxy, hydroxy, benzyloxy, halogen, or trifluoromethyl; R^1 is lower alkyl, lower alkenyl or phen(lower)alkyl; R^2 is hydrogen, or lower alkyl; R^3 is hydrogen, lower alkyl, alkenyl, or alkynyl; and n is an integer of from 2 to 6; and the pharmaceutically non-toxic addition salts thereof.

4,001,332

PROCESS FOR COMPRESSING KETENE

Günter Mau; Günter Jacobsen, and Erich Brandes, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 432,430, Jan. 10, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,110

Claims priority, application Germany, Jan. 13, 1973, 2301655

Int. Cl.² C07C *45/24*, *49/22*

U.S. Cl. 260—585.5 6 Claims

1. A process for compressing ketene which comprises: (a) introducing, as an operating liquid in a liquid ring pump, diketene; (b) compressing ketene, initially at a temperature between about −30° and 50° C. at a pressure between about 20 and about 500 mm. Hg in said liquid ring pump and obtaining said ketene as a compressed ketene at a temperature between −8° and 20° C. as a gas/operating liquid mixture having a temperature between 0° and 50° C, said diketene operating liquid being saturated with ketene under operating-conditions at a pressure of up to about 1.2 atmospheres; (c) separating ketene from said operating liquid; and (d) recirculating said operating liquid to said liquid ring pump.

4,001,333

PROCESS FOR THE PREPARATION OF DIOLDIONES

Luciano Re, and Valerio Caciagli, both of Rome, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

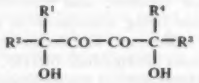
Filed June 12, 1975, Ser. No. 586,357

Claims priority, application Italy, June 12, 1974, 23897/74

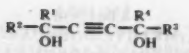
Int. Cl.² C07C *45/16*, *45/00*

U.S. Cl. 260—586 P 3 Claims

1. The process of preparing a dioldione compound represented by the formula:



in which R^1, R^2, R^3, R^4, the same or different, represent alkyl, cycloalkyl, arylalkyl, aryl or hydrogen, comprising reacting a compound represented by the formula:



wherein R^1, R^2, R^3, R^4 have the above meanings, with an aqueous oxidizing mixture constituted by at least a catalytic quantity of osmium tetroxide and at least a stoichiometric quantity of an alkali or alkali-earth metal chlorate, at a temperature in the range of from 0 to 100° C, and at sufficient pressure to maintain the system in the liquid phase.

4,001,334

RACEMIZATION OF OPTICALLY ACTIVE ALLETHROLONE

Takeaki Umemura, Takarazuka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 21, 1975, Ser. No. 597,813

Claims priority, application Japan, Aug. 12, 1974, 49-92653

Int. Cl.² C07C *45/00*; C07B *20/00*

U.S. Cl. 260—586 R 4 Claims

1. A process for preparing racemic allethrolone which comprises reacting (−) allethrolone with hydroxylamine to form the corresponding allethrolone oxime and then hydrolyzing the oxide to racemic allethrolone by contacting it with water or a mixture of water and an organic solvent miscible with water at a temperature between 0° C and 200° C in the presence of an acid, wherein said organic solvent is a member selected from the group consisting of acetone, acetylacetone, dioxane, tetrahydrofuran and mixtures thereof and said acid is a member selected from the group consisting of hydrochloric acid, sulfuric acid, acetic acid, oxalic acid, pyruvic acid, levulinic acid, trifluoroacetic acid and mixtures thereof, said acid being used in amounts sufficient to hydrolyze the allethrolone.oxime to the objective racemic allethrolone.

4,001,335

PRODUCTION OF 3-MONOCHLORO-2,4,5-TRIALKYLBENZOPHENONES AND 3,6-DICHLORO-2,4,5-TRIALKYLBENZOPHENONES

Ernst Schaffner, Ludwigshafen; Heinz Eilingsfeld, Frankenthal; Ernst Schefczik, and Manfred Patsch, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 15, 1973, Ser. No. 416,257

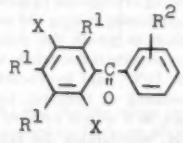
Claims priority, application Germany, Nov. 18, 1972, 2256662

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07C *49/80*

U.S. Cl. 260—591 8 Claims

1. A 3,6-dichloro-2,4,5-trialkylbenzophenone of the formula



in which the individual radicals R^1 may be identical or different and each is alkyl, R^2 is hydrogen or halogen and X is chloro.

4,001,336

2,6,10-TRIMETHYL-DODECAN-1-AL AND 2,6,10-TRIMETHYL-DODECA-4,8-DIEN-1-AL

Werner Hoffman, Neuhofen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 1, 1975, Ser. No. 601,023

Claims priority, application Germany, Aug. 16, 1974, 2439198

Int. Cl.² C07C *47/02*

U.S. Cl. 260—601 R 2 Claims

1. 2,6,10-trimethyl-dodeca-4,8-dien-1-al.

4,001,337

STABILIZED AQUEOUS FORMALDEHYDE SOLUTIONS AND PROCESS FOR THEIR MANUFACTURE

Hans Diem; Herbert Libowitzky; Guenther Matthias; Christian Dudeck, and Gunter Lehmann, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

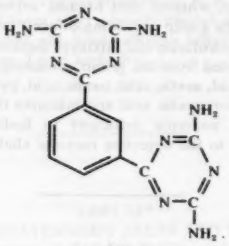
Filed Nov. 13, 1974, Ser. No. 523,443

Claims priority, application Germany, Nov. 26, 1973, 2358856

Int. Cl.² C07C *47/04*

U.S. Cl. 260—606 6 Claims

1. An aqueous formaldehyde solution containing a stabilizing amount in the range of 0.001 to 0.5% w/w of the bisguanamine having the formula



4,001,338

PURIFICATION OF DIALKYLBENZENE DIHYDROPEROXIDE

Ward J. Burkholder, Houston, Tex., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 25, 1969, Ser. No. 845,044

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² C07C *179/02*

U.S. Cl. 260—610 A 2 Claims

1. In the recovery of para-diisopropylbenzene dihydroperoxide from an oxidation reactor effluent containing dihydroperoxide and the corresponding monohydroperoxide by physically separating crude solid oxidate from the effluent, the improvement comprising mixing the solid oxidate with an aromatic hydrocarbon in which the monohydroperoxide is soluble and dihydroperoxide is essentially insoluble at temperatures befow about 30°C, said hydrocarbon being selected from the class consisting of benzene, toluene, xylene, and para-dialkylbenzenes, in a weight ratio of between about 2:1 and 1:5 respectively, maintaining the resulting mixture at a temperature of between about 55°C and the boiling point of said hydrocarbon with sufficient agitation to form a slurry, cooling the slurried mixture to a temperature below about 30°C and recovering the dihydroperoxide.

4,001,339

PHENYL DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner; Norbert Rigassi, both of Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

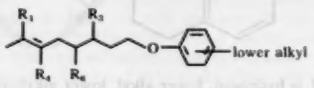
Division of Ser. No. 279,897, Aug. 11, 1972, Pat. No. 3,879,429, which is a continuation-in-part of Ser. No. 30,295, April 20, 1970, Pat. No. 3,944,531. This application Jan. 17, 1975, Ser. No. 541,749

Claims priority, application Switzerland, Apr. 30, 1969, 6597/69; South Africa, Mar. 23, 1970, 70/2003; Australia, Apr. 7, 1970, 13535/70

Int. Cl.² C07C *43/20*

U.S. Cl. 260—612 D 3 Claims

1. A compound of the formula:



wherein R_1 is methyl or ethyl, R_2 and R_3 are hydrogen, methyl or ethyl; R_4 is hydrogen or methyl; R_5 and R_6 are hydrogen or lower alkyl; Y_1 is lower alkyl; and m and n are o or 1.

4,001,340

HYDROLYSIS OF HALOAROMATIC COMPOUNDS

William E. Smith, Midland, and Edmund H. Sommerfield, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 25, 1975, Ser. No. 616,728

Int. Cl.² C07C *37/02*

U.S. Cl. 260—620 14 Claims

1. In the process of hydrolyzing a non-phenolic haloaromatic compound selected from the group consisting of halotoluenes, halobiphenyls, and dihalobenzenes of the group consisting of the o-, m-, and p-chloro- and bromotoluenes, the o-, m-, and p-chloro and bromo-biphenyls, the o-, m-, and p-dichloro- and dibromobenzenes to produce the corresponding hydroxy aromatic compounds wherein the hydrolysis is effected by reaction of the haloaromatic compound with an alkali metal hydroxide, the improvement comprising conducting the reaction at a temperature of about 250–330° C, in the presence of a phenolic compound, and with a 50–100% aqueous alkali metal hydroxide solution.

4,001,341

EXTRACTION SEPARATION

John F. Welch, and Frank P. Civardi, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 24, 1964, Ser. No. 340,101

Int. Cl.² C07C *37/28*

U.S. Cl. 260—621 B 11 Claims

1. A process for purifying, in a countercurrent extraction system, a crude 2,6-xylenol feed of 20 to 98% by weight initial purity containing phenolic impurities consisting essentially of phenol and cresols comprising introduction of aqueous inorganic alkali countercurrently to a phenolic impurity-solvent hydrocarbon phase and said crude 2,6-xylenol feed, said aqueous inorganic alkali being introduced at the top of a countercurrent extraction rectifier, said phenolic impurity-solvent hydrocarbon phase being introduced at the bottom of said countercurrent rectifier, and said crude 2,6-xylenol feed being introduced at a point intermediate thereto, whereby a substantially pure 2,6-xylenol-solvent hydrocarbon stream is removed from the top of the countercurrent extraction rectifier and a first aqueous phase stream is removed from the bottom of the countercurrent extraction rectifier consisting essentially of an aqueous solution of the inorganic alkali salts of the phenolic

impurities and a minor portion of the 2,6-xylenol, recovering said portion of the 2,6-xylenol from its aqueous alkali salt solution by contacting it countercurrently with a phenolic impurity-solvent hydrocarbon phase in a stripping zone whereby the first aqueous phase is introduced into the top of said stripping zone and the phenolic impurity-solvent hydrocarbon phase is introduced at the bottom of said stripping zone whereby a phenolic impurity-solvent hydrocarbon-2,6-xylenol stream is recovered from the top of the stripping zone and a portion recycled to the crude 2,6-xylenol feed into the countercurrent extraction rectifier, and a second aqueous phase stream is removed from the bottom of the stripping zone consisting essentially of an aqueous solution of the inorganic alkali salts of the phenolic impurities essentially free of 2,6-xylenol, springing the phenolic salts by addition of acid thereto, recovering the free phenolic impurities essentially free of 2,6-xylenol by extraction from the acidified second aqueous stream with a solvent hydrocarbon to form a phenolic impurity-solvent hydrocarbon phase and recycling a portion of said phenolic impurity-solvent hydrocarbon phase essentially free of 2,6-xylenol to the bottom of the stripping zone for recovery of the 2,6-xylenol from its aqueous inorganic alkali salt solution.

4,001,342

PRODUCTION OF ETHYLPHENOLS

Philippe Jean Andre Camerman, Wezembeek-Oppem, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Feb. 10, 1975, Ser. No. 548,446

Claims priority, application United Kingdom, Feb. 19, 1974, 7550/74

Int. Cl.² C07C *39/06*

U.S. Cl. 260—624 R **5 Claims**

1. In a process for the production of ethylphenol comprising the steps of (1) oxidizing diethylbenzene by passing a molecular oxygen containing gas into contact with said diethylbenzene at a temperature between 100° C. and 180° C. to convert 5% to 30% of diethylbenzene into diethylbenzene mono-hydroperoxide, (2) withdrawing the reaction mixture, (3) separating the unconverted diethylbenzene therefrom to obtain a mono-hydroperoxide concentrate containing at least 40% of diethylbenzene mono-hydroperoxide, (4) mixing the diethylbenzene mono-hydroperoxide concentrate with a solvent selected from the group consisting of lower alkanols, lower alkanones and mixtures thereof, (5) decomposing said monohydroperoxide by intimately contacting said mixture of diethylbenzene mono-hydroperoxide and solvent with a strong acid, whereby there is produced a decomposition mixture containing as by-products ethylacetophenone, 1-(ethylphenyl) ethanol, diacetylbenzene, 1-(acetylphenyl)ethanol, bis(1-hydroxyethyl) benzene, 1(acetylphenyl)ethylhydroperoxide, and bis(1-hydroperoxyethyl)benzene, and (6) recovering from the decomposition mixture a bottom fraction containing ethyl phenol and a top fraction containing acetaldehyde, wherein the improvement comprises the step of hydrogenating said decomposition mixture at a temperature within the range of from about 10° to 150° C., at a pressure within the range of 0.1 to 300 atmospheres and in the presence of a hydrogenation catalyst containing a transition metal of Groups VI and VII of the Periodic Table, whereby said by-products are converted into diethyl benzene or ethylphenol, without hydrogenation of the benzene nucleus, without hydrogenolysis of the phenolic hydroxyl group and without hydrogenation of any acetaldehyde or solvent which may be present, whereby the yield of ethylphenol based upon converted diethylbenzene is increased.

4,001,343

PROCESS FOR MANUFACTURING DICYCLOHEXANOL PROPANE BY HYDROGENATING DIPHENOL PROPANE

Jean Gaillard, Carrieres, and Christian Lassau, Villepreux, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 9, 1975, Ser. No. 575,996

Claims priority, application France, May 10, 1974, 74.16524

Int. Cl.² C07C *29/20*

U.S. Cl. 260—631 H **10 Claims**

1. In a process for manufacturing dicyclohexanol propane by hydrogenating diphenol propane dissolved in a solvent, by molecular hydrogen in the presence of a hydrogenation catalyst selected from the group consisting of Raney nickel, nickel deposited on a carrier, a noble metal from group VIII, and a reaction product of at least one transition metal compound with AlR_3 wherein R is hydrogen, hydrocarbyl or hydrocarbyloxy, the improvement in which 2-ethylhexanol is used as the solvent.

4,001,344

CATALYST FOR PARTIAL HYDROGENATION

Herwig Hoffmann, Frankenthal; Guenther Boettger, Bad Duerkheim; Karl Baer, Weinheim; Harro Wache, Fussgoenheim; Heinz Graefje, Ludwigshafen, and Wolfgang Koernig, Dossenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 30, 1975, Ser. No. 591,834

Claims priority, application Germany, July 3, 1974, 2431929

Int. Cl.² C07C *33/02*

U.S. Cl. 260—635 M **10 Claims**

1. A process for the manufacture of butene-2-diol-1,4 by hydrogenation of butynediol in aqueous solution in the presence of a supported catalyst which comprises: contacting said butynediol with a catalyst, said catalyst comprising from 0.05 to 2 percent palladium and from 0.05 to 1 percent of zinc and cadmium.

2. A process for the manufacture of butene-2-diol-1,4 by hydrogenation of butynediol in aqueous solution in the presence of a supported catalyst which comprises: contacting said butynediol with a catalyst, said catalyst comprising from 0.05 to 2 percent palladium, from 0.05 to 1 percent zinc or cadmium, and from 0.05 to 1 percent of bismuth and/or tellurium.

4,001,345

DISTILLATION OF METHYLCHLOROFORM

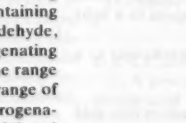
Earl M. Gorton, Sulphur, and Robert W. Kline, Lake Charles, both of La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 2, 1975, Ser. No. 583,228

Int. Cl.² C07C *17/38*, *19/02*

U.S. Cl. 260—652 P **3 Claims**

1. An improved method of purifying methylchloroform containing ferric chloride which comprises dissolving in the methylchloroform at least about two moles of quaternary ammonium halide represented by the formula:



where

R_1, R_2, R_3 and R_4 may be the same or different and are selected from methyl radicals, or alkyl and alkenyl radicals of 7 to 20 carbon atoms, provided that at least one and no more than two members of the group R_1, R_2, R_3 and R_4 are methyl radicals; and X is bromine, iodine or chlorine.

per mole of ferric chloride and distilling methylchloroform therefrom.

4,001,346

SELECTIVE PRODUCTION OF PARA-XYLENE

Chin-Chiun Chu, South Plainfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 538,664, Jan. 6, 1975. This application Apr. 2, 1976, Ser. No. 673,167

Int. Cl.² C07C *3/52, 15/08*

U.S. Cl. 260—671 M **10 Claims**

1. A process for the selective production of para-xylene which comprises reacting toluene with a methylating agent in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range from 1 to 12, which catalyst has undergone prior treatment to deposit a coating of between about 15 and about 75 weight percent of coke thereon.

4,001,347

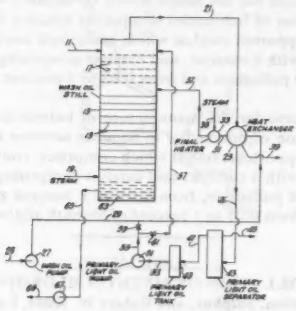
METHOD FOR THE REMOVAL OF NAPHTHALENE FROM COKE OVEN GAS

Herbert A. Grosick, Allison Park, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,959

Int. Cl.² C07C *7/00*

U.S. Cl. 260—674 N **1 Claim**



1. A system for removing naphthalene from coke oven gas comprising:

a. a wash oil still wherein there are a plurality of normal first trays and in spaced apart relation thereabove a plurality of additional second trays;

b. a conduit carrying oil from a naphthalene scrubber into the top portion of said still at a level above the topmost second tray;

c. a conduit carrying light oil vapors from said still to a heat exchanger from which a conduit carries vapors to a light oil rectifier;

d. a conduit carrying light oil from said heat exchanger to a primary light oil separator;

e. a conduit carrying steam into said still;

f. a conduit carrying wash oil from benzol washers into said heat exchanger;

g. a conduit carrying said wash oil from said heat exchanger to and into said wash oil still at a level between said first and second sets of trays;

h. a conduit carrying primary light oil from said separator into a primary light oil tank and thence into said wash oil still at a level above said topmost second tray; and

i. a conduit carrying wash oil away from said still.

4,001,348

UNSATURATED POLYESTER RESINS CONTAINING ADDITIONAL ACCELERATORS

Harald Selbeck, Krefeld-Gartenstadt; Rolf Dhein, Krefeld-Bockum; Hans Rudolph, Krefeld; Manfred Patheiger, Krefeld, and Otto Bendszus, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Nov. 11, 1975, Ser. No. 630,938

Claims priority, application Germany, Nov. 15, 1974, 2454325

Int. Cl.² C08L *67/06;* **C08K** *5/04*

U.S. Cl. 260—864 **7 Claims**

1. A composition comprising:

A. from 20 to 90 %, by weight, based on the sum of components (A) and (B), of at least one α,β-ethylenically unsaturated polyester;

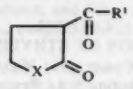
B. from 80 to 10 %, by weight, based on the sum of components (A) and (B), of at least one polymerisable ethylenically unsaturated compound;

C. from 0.1 to 8.0 %, by weight, based on the sum of components (A) and (B), of at least one polymerisation initiator;

D. from 0.001 to 0.1 %, by weight, based on the sum of components (A) and (B), of at least one polymerisation inhibitors;

E. from 0.001 to 0.5 %, by weight, based on the sum of components (A) and (B), of at least one accelerator; and

F. from 0.05 to 5.0 %, by weight, based on the sum of component (A) and (B) of at least one compound corresponding to the followng general formula:



wherein

X represents O, S or $>NR^2$

R^1 represents a C_1-C_8 aliphatic radical, —OH, $—NR^4R^5$, cyclohexyl, cyclopentyl, a C_1–C_4 alkoxy radical or $—COOR^3$,

R^2 represents a hydrogen atom, a C_1–C_8 aliphatic radical a C_5–C_8 cycloaliphatic radical, acetyl, benzoyl or benzyl,

R^3 represents a hydrogen atom, a C_1–C_8 aliphatic radical or an optionally substituted aromatic radical,

R^4 and R^5 which may be the same or different, each represents a hydrogen atom, a C_1–C_4 aliphatic radical, phenyl or cyclohexyl or R^4 and R^5 taken together represent a C_4–C_8 cycloaliphatic radical.

4,001,349

IMPACT RESISTANT POLYSTYRENE AND A PROCESS FOR ITS PRODUCTION

Febo Severini; Carlo Tavazzani, both of Milan, and Piero Delle Ville, Novara, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Apr. 11, 1975, Ser. No. 567,312

Claims priority, application Italy, Apr. 12, 1974, 21367/74

Int. Cl.² C08F *255/04, 255/06;* **C08L** *23/26*

U.S. Cl. 260—878 R **3 Claims**

1. Process for preparing crude graft products of styrene on saturated polyolefinic elastomers consisting of copolymers of ethylene with alpha-olefins containing from 3 to 6 carbon atoms or on low unsaturation polyolefinic elastomers consisting of copolymers of ethylene with at least one of said alpha-olefins and at lest one diene or polyene hydrocarbon, in which graft products the by-weight ratio polystyrene of the gel/total rubber is greater than 1.0 and not greater than 1.8, said process comprising heating a mixture containing the styrene, the elastomer and a radical initiator in two phases, the first phase being conducted between 50° and 150° C, in the presence of water in a by-weight ratio water/oily phase comprised between

0.3 and 2, operating in the absence of surfactants, until a styrene conversion comprised between 15 and 40% is reached; and the second phase being carried out by suspension polymerization with the aid of one or more suspending agents and of a radical initiator, while stirring the reaction mass and heating it at temperatures up to 150° to 200° C.

4,001,350

BLOCK AND GRAFT COPOLYMERS

Gerhard Fahrbach, Plankstadt; Erhard Seiler, Freiburg, and Karl Gerberding, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 30, 1974, Ser. No. 537,119

Claims priority, application Germany, Jan. 15, 1974, 2401629

Int. Cl.² C08L 9/06

U.S. Cl. 260—880 B **14 Claims**

1. Block or graft copolymers consisting essentially of

1. A substantially linear elastomer block B having a molecular weight of from 10,000 to 1,000,000, said block being formed from units of anionically polymerizable monomers *b*; and

2. one or more copolymer blocks A of alternately polymerized monomers *a* and *a'*, of which *a* has a polar group and *a'* a phenyl group, said ends of said block B being joined to blocks A via one or more monomer units of aromatic nuclei bearing nonvinyl groups or vinylidene groups.

4,001,351

PROCESS FOR PREPARING TETRAFLUOROETHYLENE-HEXAFLUOROPROPYLENE COPOLYMER BLENDS

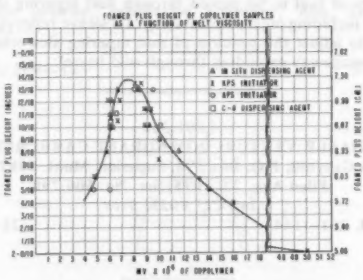
Miguel Jacinto Roura, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1975, Ser. No. 564,902

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08L 27/12

U.S. Cl. 260—900 **4 Claims**


FOAMED PLUS HEIGHT OF COPOLYMER SAMPLES AS A FUNCTION OF MELT VISCOSITY
A IN SITU DISPERSING AGENT
APS INITIATOR
APS INITIATOR
C-8 DISPERSING AGENT
FOAMED PLUS HEIGHT (INCHES)
FOAMED PLUS HEIGHT (CM.)
MV X 10⁴ OF COPOLYMER

1. A process which comprises heating separately in an atmosphere of air containing between about 3% and about 20% of water vapor, based on weight of atmosphere, at between about 340°C. and about 380°C. for a time sufficient to remove substantially all volatiles, groups of melt-processible copolymers of tetrafluoroethylene and hexafluoropropylene having between about 6.75 and about 27 weight percent hexafluoroethylene:

A. one said group of such copolymers comprising at least one or more copolymers having a melt viscosity that is between about 13×10^4 and 50×10^4 poise at 372°C.;

B. a second said group of such copolymers comprising at least one or more copolymers having a melt viscosity that is between about 1×10^4 and 5×10^4 poise at 372°C.; and

C. optionally, a third said group of such copolymers comprising at least one or more copolymers having a melt viscosity of between about 5×10^4 and 13×10^4 poise at 372°C.; and after heating, combining group (A) with group (B) and optionally group (C) in such a ratio so as to obtain a final blend product having a melt viscosity between 5×10^4 and 13×10^4 poise at 372°C.

4,001,352

PROCESS FOR THE PREPARATION OF ETHANE-1,2-DIPHOSPHINIC ACID DIESTERS

Hans-Jerg Kleiner, Bad Soden, Taunus, and Walter Rupp, Schneidhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

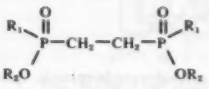
Continuation of Ser. No. 434,030, Jan. 17, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,769

Claims priority, application Germany, Jan. 19, 1973, 2302523

Int. Cl.² C07F 9/40

U.S. Cl. 260—970 **5 Claims**

1. In a process for the preparation of an ethane-1,2-diphosphonic acid diester of the formula



wherein R_1 represents an alkyl, phenyl and/or phenylalkyl group having from 1 to 18 carbon atoms and R_2 is an alkyl group or a halogen substituted alkyl group having from 1 to 18 carbon atoms, by reacting with acetylene a phosphonous acid ester of the formula

wherein R_1 and R_2 are as defined above, at a temperature of from 50° to 230° C in the presence of a catalytic amount of a radical-forming agent, the improvement which comprises first heating said phosphonous acid ester to the desired reaction temperature under atmospheric pressure with the exclusion of atmospheric oxygen and then introducing acetylene and simultaneously slowly adding the radical-forming agent dissolved in said phosphonous acid ester.

4,001,353

PREPARATION OF O,S-DIMETHYL-THIOL-PHOSPHORIC ACID DIESTER-AMIDE

Wolfgang Hofer, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 303,302, Nov. 2, 1972, Pat. No. 3,845,170. This application Mar. 27, 1974, Ser. No. 455,486

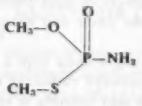
Claims priority, application Germany, Nov. 16, 1971, 2156718

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07F 9/24

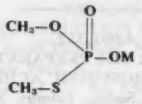
U.S. Cl. 260—984 **3 Claims**

1. A process for the production of O,S-dimethyl-thiol-phosphoric acid diesteramide of the formula



which comprises reacting about 1.3 moles of phosgene with

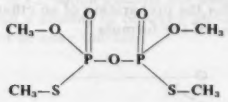
about 2 moles of a salt of O,S-dimethyl-thiolphosphoric acid ester of the formula



in which

M is an alkali metal of ammonium,

at about 20° to 60°C in the presence of a diluent to form tetramethyl-dithiolpyrophosphoric acid ester of the formula



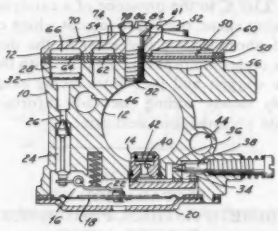
and contacting the tetramethyl-dithiolpyrophosphoric acid ester in an inert diluent with ammonia.

4,001,354

COVER PLATE FOR A CARBURETOR BODY

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Nov. 17, 1975, Ser. No. 632,277
Int. Cl.² F02M 17/04
U.S. Cl. 261—35 **5 Claims**



1. A cover plate for a carburetor body in which sealing gaskets are provided between the plate and the body which comprises:

a. a rectangular, relatively-flat plate having peripheral and other bottom surfaces to contact a gasket interposed between the plate and the body,

b. an upstanding boss formed on said plate rising above the general surface thereof, said boss having an opening to receive a holding screw,

c. a plurality of spaced ribs on the top surface of said plate and integral with said boss and plate and extending from the top portion of said boss centrally of said plate to the periphery at the corners of said plate raised above the general surface of the plate and extending to the outer edges, and

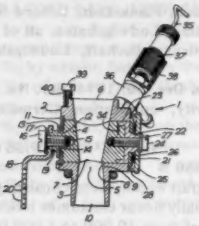
d. a holding screw having a head with a surface to contact and apply a radial outward camming force on the upper portion of the wall of said opening in said boss and on said ribs to hold said plate on said carburetor when said screw is moved axially into said body.

4,001,355

CARBURETOR

Kenneth Edwin Day, 14, Riversdale Road, Thames Ditton, Surrey, England

Filed July 10, 1975, Ser. No. 594,611
Claims priority, application United Kingdom, July 12, 1974, 31088/74
Int. Cl.² F02M 9/08
U.S. Cl. 261—44 R **10 Claims**



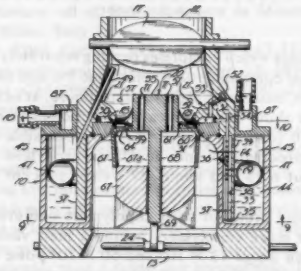
1. A carburettor comprising a body provided with fuel control valve means, means to secure the body to an engine, a barrel rockably mounted in the body and means for rocking said barrel, means defining a passage extending through the body and the barrel to the engine which passage can be restricted by rotation of the barrel relative to the body, the part of the passage through the body and the barrel being tapered down to the trailing edge of the barrel, the barrel being provided with a sleeve member embracing part thereof, said sleeve member having a circumferential tapering slot, the barrel having a fuel passageway defined therein extending from said tapering slot in the circumferential edge of the sleeve member to an opening adjacent said trailing edge of the barrel, which opening also communicates with said passage extending through said body and said barrel in all operative positions of the barrel, the tapering slot being adjacent a hole extending through the body and leading to said fuel control valve means so that movement of the barrel alters the cross section of said tapering slot presented to said hole to meter the quantity of fuel to be passed through said tapering slot and further including means for rotating said sleeve relative to said barrel to adjust the position of said tapering slot relative to said passageway extending through said barrel.

4,001,356

VARIABLE VENTURI DOWNDRAFT CARBURETOR

Clinton Graybill, P.O. Box 396, Superior, Mont. 59872

Filed Aug. 22, 1975, Ser. No. 606,798
Int. Cl.² F02M 9/14
U.S. Cl. 261—144 **21 Claims**



1. A downdraft variable venturi carburetor for an internal combustion engine, comprising:

a hollow carburetor body having an upwardly open air

intake end and a downwardly open end adapted to be mounted to an intake manifold of an internal combustion engine and a fuel-air mixing chamber intermediate the ends for receiving and guiding air in a downstream flow from the intake and through the downwardly open end and into the manifold;

an annular fuel dispensing orifice encircling the fuel mixing chamber within the body;

means for supplying fuel to the orifice at a plurality of angularly spaced locations in response to operation of the engine;

a first movable venturi member located centrally within the body along an upright axis for axial movement therein within the mixing chamber;

wherein the first venturi member is substantially bell-shaped and includes a reduced end facing the intake end; a convex portion curving down and outwardly from the reduced end to a downstream edge; a first axial rim extending downstream from the downstream edge of the convex portion; a first outwardly beveled portion extending downstream from the first axial rim; and an inwardly beveled portion extending downstream from the first outwardly beveled portion;

a second venturi member defining the orifice and located coaxially with and radially adjacent to the first venturi member;

wherein the first and second venturi members together form an annular restricted air passage downwardly adjacent to the fuel dispensing orifice; and

throttle means for axially moving the first venturi member relative to the second venturi member to enlarge and reduce the restricted air passage and thereby increase and decrease the flow of air and fuel through the mixing chamber.

4,001,357

PROCESS FOR THE MANUFACTURE OF FIBERS FROM FUSIBLE MATERIALS

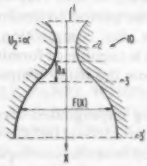
Alfred H. Walz, Emmendingen, and Paul-Jürgen Hahn, Karlsruhe-Durlach, both of Germany, assignors to Alfred Walz, Emmendingen, Germany

Filed Aug. 1, 1973, Ser. No. 384,565

Claims priority, application Germany, Aug. 2, 1972, 2237884

Int. Cl.² B22D *23/08*

U.S. Cl. 264—12 **8 Claims**



1. A method for the manufacture of fine fibers from fusible low-viscosity melts of inorganic, mineral or metal materials or organic materials, comprising:

heating the starting material to a temperature above the melting point thereof;

causing said melt to pass through an orifice means into a Laval-nozzle;

causing a pressure drop across the Laval-nozzle of a magnitude sufficient to bring a flow medium, which carries said melt, passing through the nozzle to supersonic speed therewithin; and

causing the temperature of the flow medium to drop abruptly in a sufficiently short distance within the Laval-nozzle to solidify the melt into the form of fibers before the surface tension of the melt forms the melt into droplets, by selecting an appropriate configuration of said Laval-nozzle.

4,001,358

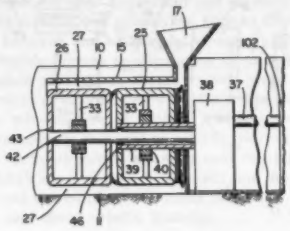
APPARATUS AND METHOD FOR FORMING A CEMENTITIOUS CONDUIT IN SITU

Charles T. McNeill, and Melba F. Silva, both of Yuba City, Calif., assignors to No-Joint Concrete Pipe Co., Yuba City, Calif.

Continuation-in-part of Ser. No. 256,891, May 25, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 548,105

Int. Cl.² E03F *3/06*

U.S. Cl. 264—33 **25 Claims**



1. The method of continuously forming smooth walled concrete pipe in situ in a ditch or the like comprising the steps of:

a. defining an elongated volume of generally annular cross-section having a cylindrical inner surface within said ditch with the axis of elongation of the annular volume extending along said ditch and with one end of said annular volume closed and the other end thereof open;

b. introducing a solidifiable cementitious material into said annular volume at the closed end thereof;

c. continuously urging said solidifiable cementitious material to move toward said open end of said annular volume at a rate at least as great as and substantially equal to a given rate by applying frictional forces including components acting in one circumferential direction and components acting in the axial direction toward said open end of said annular volume to said cementitious material in a first portion of said annular volume immediately adjacent said closed end thereof and having an axial length less than about one-half the axial length from the closed end to the open end. of said annular volume; and simultaneously,

d. moving said annular volume along said ditch at said given rate with the closed end of said annular volume preceding the open end thereof and

e. applying frictional forces in the second circumferential direction opposite said one circumferential direction to said cementitious material at the inner surface of said annular volume throughout a second portion of said annular volume comprising the remaining length thereof.

4,001,359

TESTING AND CORRECTING METERING ACCURACY OF MULTIHOLE SPINNERETS

William Bernard Fisher, Chester; Howard Lyle Helmer, Colonial Heights, and David Pendlebury, Chester, all of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

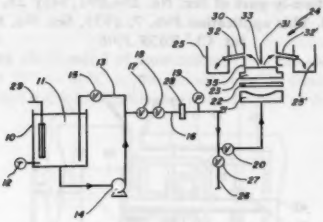
Division of Ser. No. 507,509, Sept. 19, 1974, Pat. No. 3,930,775. This application July 7, 1975, Ser. No. 593,402

Int. Cl.² G01B *13/08*

U.S. Cl. 264—40.1 **11 Claims**

1. A method for off-line testing and correcting the metering accuracy of a split multihole spinneret fed by a single metered stream, comprising the steps of: (a) feeding through the split spinneret a fluid having a viscosity such that its flow through the holes of the split spinneret is laminar, by a single metered

steam which hydraulically splits to each of the sides of the split spinneret; (b) collecting in segregation according to the sides of the split spinneret the fluid as it flows therefrom; (c) weighing separately the segregated collections of fluid; (d) determining the percent bias of the split spinneret; (e) choosing the side of the split spinneret with the lower flow rate for reworking of its respective holes; (f) calculating the number of holes to be reworked in said side of the split spinneret by the equation



$$N = k \times D$$

where

N is the number of holes to be reworked,

k is a constant between 15 and 150, and

D is the percent bias of the split spinneret; and (g) reworking approximately the number of holes "N" in the side of the split spinneret having said lower flow rate.

4,001,360

METHOD FOR PREPARING PULVERULENT POLYMERS EXHIBITING AN APPARENT INCREASE IN GLASS TRANSITION TEMPERATURE AND SHAPING THE RESULTANT POLYMER MATERIALS

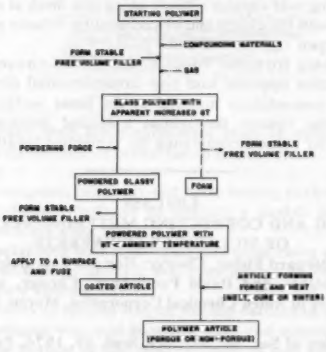
William J. Davis, 1700 Reading Blvd., Wyomissing, Pa. 19610, and Anthony J. Izbicki, 1704 Westwood Drive, Reading, Pa. 19610

Continuation of Ser. No. 215,565, Jan. 5, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,164

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² B29D *27/00, 27/08*

U.S. Cl. 264—49 **13 Claims**


STARTING POLYMER
COMPOUNDING MATERIALS
FORM STABLE FREE VOLUME FILLER
GAS
GLASS POLYMER WITH APPARENT INCREASED GT
POWDERING FORCE
FORM STABLE FREE VOLUME FILLER
POWDERED GLASSY POLYMER
FOAM
FORM STABLE FREE VOLUME FILLER
POWDERED POLYMER WITH GT< AMBIENT TEMPERATURE
APPLY TO A SURFACE AND FUSE
COATED ARTICLE
ARTICLE FORMING FORCE AND HEAT (MELT, CURE OR SINTER)
POLYMER ARTICLE (POROUS OR NON-POROUS)

1. A method for preparing a polymer in pulverulent form comprising the steps of dissolving a sugar into a liquid suspension of finely divided particles of the polymer, coagulating with precipitation the polymer suspension removing the liquid from the coagulated and precipitated suspension to form a dried polymer mass, comminuting the dried polymer mass and removing the sugar from the comminated polymer mass.

4,001,361

MOBILE HOME SKIRTING SIDE PANEL

Earl L. Unruh, 612 Pinewood Drive, San Jose, Calif. 95129

Filed Oct. 29, 1974, Ser. No. 518,345

Int. Cl.² E04C *2/20;* **B29D** *27/00*

U.S. Cl. 264—51 **1 Claim**

1. A process for forming a skirting panel having a surface configuration simulating masonry blocks comprising the steps of: providing a mold for said panel having a mold surface including a plurality of generally rectangular cavities complementary to masonry blocks; filling said mold with expandable beads of polystyrene; and applying heat to said beads to fuse the same together and form said panel with a density of between about 1 and 2 pounds per cubic foot, whereby cavity interstices are formed between fused beads at said surface configuration which simulate the surface cavitations on masonry blocks.

4,001,362

METHOD FOR THE TREATMENT OF CLAY AND PRODUCTS OBTAINED

Bernard Delmon, Wavre; Jacques LeMaitre, and Michel Bulens, both of Brussels, all of Belgium, assignors to UNIBRA, Brussels, Belgium

Filed Sept. 18, 1974, Ser. No. 507,177

Claims priority, application France, Oct. 3, 1973, 73.35287; May 31, 1974, 74.18959

Int. Cl.² C04B *33/32*

U.S. Cl. 264—56 **21 Claims**

1. A method for the treatment of clay compositions, comprising

contacting the clay composition with a liquid phase containing metal ions in a concentration of at least 0.001 gram equivalent per liter, in sufficient amount to provide a total of from 1 to 40 mole percent of said metal ion based on contained alumina in said clay composition, for a sufficiently long time period to ensure diffusion of said ions throughout the clay composition, wherein the metal of said metal ions is capable of forming its oxide at a temperature at or below the firing temperature of the clay composition; and

firing the resulting impregnated clay composition at a temperature of from 750°–1100° C. whereby said metal ions are transformed into the corresponding oxides.

4,001,363

METHOD OF MANUFACTURING A CERAMIC FERROMAGNETIC OBJECT

Leonardus Josephus Koppens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 117,355, Feb. 22, 1971, abandoned. This application Sept. 13, 1974, Ser. No. 505,656

Claims priority, application Netherlands, Mar. 19, 1970, 7003901

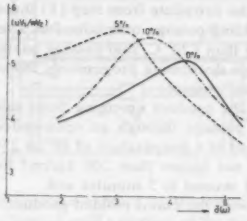
Int. Cl.² C04B *35/26*

U.S. Cl. 264—61 **5 Claims**

1. A method of manufacturing ferromagnetic objects, comprising the steps of forming an aqueous suspension comprising the combination of a ferromagnetic powder having the composition $M_{A_x}^{2+}\ M_{B_{1-x-y}}^{2+}\ M_{Cy}^{2+}\ Fe_2^{3+}\ O_4$, a sol having the

composition $M_{A_x}^{2+} M_{B_{1-x-y}}^{2+} M_{C_y}^{2+} Fe_2^{3+} (OH)_8$, wherein M_A, M_B, or M_C are bivalent metals or bivalent metal complexes, and wherein:

$0 \leq x \leq 1$
$0 \leq y \leq 1$
$x + y \leq 1$



and a polymerized organic compound, applying said suspension to a substrate, drying said suspension to form a layer on said substrate, forming objects of desired shape and dimensions from said layer, and heating said objects to eliminate said polymerized organic compound, convert said sol to the ferromagnetic powder, and form coherent bodies of said ferromagnetic powder.

4,001,364

METHOD FOR IMPROVING THE PHYSICAL PROPERTIES OF CERAMICS

Kazuo Suzuki, Otu, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 326,252, Jan. 24, 1973, abandoned, and a continuation-in-part of Ser. No. 329,992, Feb. 6, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,705

Claims priority, application Japan, Aug. 3, 1972, 47-58813; Sept. 1, 1972, 47-6763

Int. Cl.² C04B *35/64*

U.S. Cl. 264—63 **6 Claims**

1. A method for improving the physical properties of ceramics, comprising the steps of coating 100 parts by weight particles of said ceramics with 5 to 10 parts by weight atactic polypropylene; forming the coated ceramics into desired shape under cold compression of 200 to 400 Kg/cm²; and sintering the formed product at 1100° C to 1300° C, wherein said ceramic is barium ferrite or low soda alumina.

4,001,365

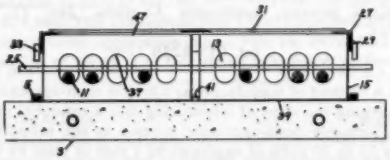
LOAD-BEARING WALL PANEL WHOSE ELEMENTS ARE MORTAR-BINDED, AND APPARATUS AND METHOD FOR FABRICATING SAME

Wilson E. Graham, R.D. No. 1, Rensselaer, N.Y. 12144

Filed Jan. 20, 1975, Ser. No. 542,585

Int. Cl.² B28B *1/08*; B32B *31/06*

U.S. Cl. 264—69 **8 Claims**



1. A method of fabricating a wall panel whose elements have mortar-binded joints, the facings of which are double-concave, smooth, water-proof and weather-proof, comprising: disposing said elements on trapped, melted thermoplastic material with the temperature of said elements being sufficiently cooler than the temperature of said melted thermoplastic material such that upon contact of said elements with said melted thermoplastic material a thin skin of solidified thermoplastic material forms on the bottom portions of said elements, forcing said melted thermoplastic material between and within said joints of said elements, immediately thereafter allowing said elements contacting said melted thermoplastic material at joint surfaces between said elements to cool, solidify and form thereby a thin skin of solidified thermoplastic material on said contacting joint surfaces between said elements and with said melted thermoplastic material in the mid points between and within said element joints remaining in a melted state, such that said melted thermoplastic material at said mid points between and within said element joints, upon subsequently cooling and solidifying, shrinks the most at said mid points between and within said element joints and forms thereby a double-convex configuration of said thermoplastic material within said joints, thereby water-proof sealing said bottom portions of said elements and their said joints preparatory to the introduction of mortar; allowing the remaining melted thermoplastic material to solidify; introducing mortar within said element joints; allowing said mortar to cure to complete fabrication of said wall panel and for removal of same from said thermoplastic material; and removing said wall panel from said thermoplastic material.

4,001,366

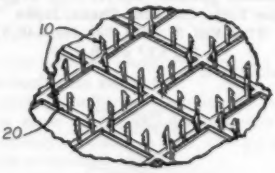
METHOD FOR MAKING SELF-GRIPPING DEVICES HAVING INTEGRAL TRAINS OF GRIPPING ELEMENTS

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners Inc., Montclair, N.J.

Continuation of Ser. No. 214,871, Jan. 3, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 401,083

Int. Cl.² B29H *7/18*; A44B *17/00*

U.S. Cl. 264—147 **1 Claim**



1. Process for forming a self-gripping device which comprises extruding a base with a plurality of parallel, integral ribs thereon extending in the direction of extrusion, said ribs having the shape of a gripping element in cross-section and being oriented at right angles to the direction of extrusion, slitting said ribs through said base generally transverse to the direction of extrusion and stretching and expanding said base and said ribs thereby forming an open, net-like structure of crossing members from said base with spaced apart gripping elements from said ribs integrally extending from said crossing members.

4,001,367

METHOD FOR PERMANENTLY AND UNIFORMLY INCORPORATING AN ADDITIVE INTO AN UNDRAWN FIBER

Roger T. Guthrie, Westfield; Justin L. Hirshman, East Brunswick; Stanley Littman, Somerset; Edwin L. Sukman, Fanwood, and Philip H. Ravenscroft, Clark, all of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

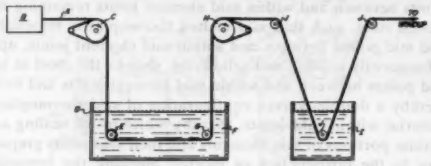
Continuation-in-part of Ser. No. 456,130, March 29, 1974, abandoned. This application Nov. 7, 1974, Ser. No. 521,843

Int. Cl.² B29C *17/02*; B29D *27/00*

U.S. Cl. 264—154 **31 Claims**

1. A method of permanently and uniformly incorporating between 0.1 and 25% by weight of an additive into an un-

drawn or partially drawn fiber formed from a molten polymer selected from the group consisting of polyesters, polyamides, polyesteramides, polypropylene and high density polyethylene, the method comprising cold drawing said fiber at a draw ratio of between 1.5:1 and the breaking elongation of the fiber to achieve a localized reduction in diameter concurrently with formation of an interconnecting network of microvoids that occurs while the fiber is immersed in a liquid or vapor medium containing said additive as a solution, dispersion or emulsion, at a concentration of between 0.1 and 99% by weight wherein



1. the maximum particle size of a dispersed or emulsified additive does not exceed two microns;
2. the medium is a non-solvent for the undrawn fiber and penetrates into said network of interconnecting microvoids;
3. the wetting angle defined by the liquid medium and the surface of said fiber is less than 90°; and
4. the temperature of the medium is below the effective glass transition temperature of said fiber when in contact with the medium.

4,001,368

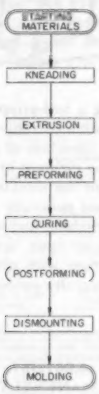
METHOD FOR CONTINUOUS EXTRUSION MOLDING OF THERMOSETTING RESINS

Yoshio Michizoe, Takatsuki; Masafumi Toyomatsu, Kadoma, and Masakatsu Uchida, Nagoya, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Feb. 8, 1974, Ser. No. 440,810

Int. Cl.² B28B *3/20*

U.S. Cl. 264—176 R **9 Claims**



1. A method for continuous molding of a thermosetting resinous composition to form a cured product, said method comprising the steps of:

1. extruding a thermosetting resinous composition comprising by weight
   a. 100 parts of a mixture of an uncured unsaturated polyester resin and a copolymerizable unsaturated monomer in the weight ratio of 80/20 to 30/70, respectively,
   b. 1–70 parts of thermoplastic vinyl chloride resin powder,
   c. 0.2 – 3 parts of a polymerization initiator and
   d. a non-reactive filler in a screw-type extruder in which the cylinder temperature is maintained at a at a level not exceeding 92° C. so that the composition has at the outlet end of the extruder a flowability corresponding to a needle penetration degree of at least 20 under a load of 100g for a loading time of 5 seconds according to ASTM D5 and the composition is not cured in the extruder,
2. passing the extrudate from step (1) through a preliminary molding passage maintained at a temperature of not more than 120° C, said passage having a cross-sectional area decreasing progessively towards the outlet end of said passage;
3. passing the product emerging from said preliminary molding passage through an open-ended die passage maintained at a temperature of 80° to 250° C., under a pressure not higher than 200 kg/cm² for a residence time of 1 second to 5 minutes and
4. withdrawing the cured molded product.

4,001,369

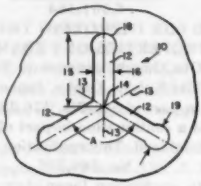
PROCESS FOR COSPINNING TRILOBAL FILAMENTS

Chandrakant Shantilal Shah, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 4, 1976, Ser. No. 663,834

Int. Cl.² B28B *21/54*

U.S. Cl. 264—177 F **8 Claims**



1. In a process for cospinning at least two synthetic trilobal filaments from the same polymer composition wherein the undrawn filaments have a difference between their modification ratios of at least 0.3 MR units, the improvement comprising spinning one filament from a spinneret orifice having a configuration comprised of three radially intersecting slots with each slot having parallel sides and spinning the other filament from a spinneret orifice having a configuration comprised of three radially intersecting tapered slots.

4,001,370

MANUFACTURING OF RESIN-AGGREGATE PIPES

Clifford Aubrey Baker, Glen Waverley, Australia, and Rex Miller, deceased, late of Kilsyth, Australia (by Florence Edith Miller, executrix), assignors to Humes Limited, Melbourne, Australia

Division of Ser. No. 838,009, June 16, 1969, abandoned, which is a continuation of Ser. No. 610,966, Jan. 23, 1967, abandoned. This application Apr. 9, 1973, Ser. No. 349,479

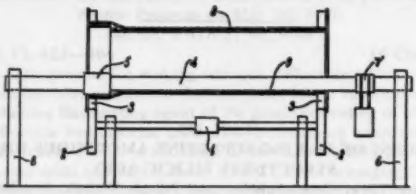
Claims priority, application Australia, Jan. 27, 1966, 916/66

Int. Cl.² B28B *1/20*

U.S. Cl. 264—256 **6 Claims**

1. A method of manufacturing a hollow resin-aggregate pipe comprising the steps of introducing into a rotatable mould a pipe formable resin-aggregate mixture in the proportion of from 12 to 20 parts of aggregate to 1 part of resin by weight, rotating the mould to apply centrifugal force to the mixture to form the pipe, moving a compacting roller into contact with the pipe being formed and rotating the compacting roller at a speed greater than the speed of rotation of the mould, applying pressure to the compacting roller to force the compacting roller against the pipe being formed to compact the mixture

until the speed of the roller is reduced and a portion of the mixture adheres to the compacting roller, reducing the pressure exerted by the compacting roller on the pipe being formed until the original speed of the roller is reached causing the roller to be cleaned of the adhering portion of the mixture,



increasing the pressure exerted by the compacting roller on the pipe being formed until a portion of the mixture adheres to the compacting roller and repeating the steps of reducing and increasing the pressure exerted by the compacting roller on the pipe being formed until a portion of the mixture no longer adheres to the compacting roller and the pipe is compacted.

4,001,371

CATALYTIC PROCESS

Joseph Peter Remeika, Warren, and Rudolf Johannes H. Voorhoeve, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 375,948, July 2, 1973, Pat. No. 3,884,837. This application Mar. 6, 1975, Ser. No. 555,809

Int. Cl.² B01D *53/34*

U.S. Cl. 423—213.2 **5 Claims**

1. In a catalytic process for the removal from a gas flow of at least one material from the group, carbon monoxide, hydrocarbons and nitrogen oxides of the formula NO_x, at elevated temperatures, the improvement comprising contacting said gas flow with a catalyst containing an active ingredient consisting essentially of a perovskite-like manganite of at least one rare earth element selected from the group consisting of La, Pr, and Nd in which the said rare earth element is partially replaced, in that the said manganite is of a composition represented by the atom formula $RE_{1-x}M_xMnO_3$ in which RE is at least one element selected from the group consisting of La, Pr, and Nd; M is at least one element selected from the group consisting of Na, K, and Rb in which x is from **0.1** to **0.4** and in which the amount of any of the indicated cations may be reduced by up to about **15** atoms percent to accommodate vacancy structures.

4,001,372

REMOVING OXIDES OF NITROGEN FROM GASEOUS MIXTURES WITH ALKALI MANGANATE SOLUTIONS

Taijiro Okabe; Akitsugu Okuwaki, both of Sendai, and Shigetoshi Nakabayashi, Shinminato, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 332,792, Feb. 16, 1973, Pat. No. 3,929,966. This application July 1, 1975, Ser. No. 592,318

Claims priority, application Japan, Feb. 19, 1972, 47-17556

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.² C01B *21/00*

U.S. Cl. 423—235 **6 Claims**

1. A method for removing oxides of nitrogen (NOx) existing in a gaseous mixture and consisting predominantly of nitric oxide and nitrogen dioxide, which consists essentially of subjecting said gaseous mixture to a contact-reaction with an aqueous solution consisting essentially of an alkali metal manganate and an alkali metal hydroxide, thereby absorbing the oxides of nitrogen into the solution.

4,001,373

REMOVAL OF TETRANITROMETHANE FROM TNT PLANT WASTE

Thomas N. Hall, Adelphi, Md., and William H. Gilligan, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 18, 1975, Ser. No. 605,775

Int. Cl.² B01D *53/34*

U.S. Cl. 423—236 **34 Claims**

1. A gas scrubbing process for removing tetranitromethane from trinitrotoluene plant waste gases comprising scrubbing the waste gases with a solution of (1) water, (2) hydrogen peroxide, and a hydroxyl ion source selected from the group consisting of ZOH, Z_2CO_3, and mixtures thereof wherein Z is selected from the group consisting of Li^+, Na^+, K^+, Cs^+, Rb^+ and mixtures thereof.

4,001,374

PROCESS FOR REMOVING AMMONIA FROM GASES

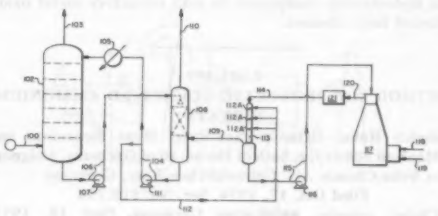
Egon Haese, Bochum-Linden, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed July 2, 1974, Ser. No. 485,232

Claims priority, application Germany, July 2, 1973, 2333518

Int. Cl.² C01C *3/00*

U.S. Cl. 423—237 **7 Claims**



1. A process for removing ammonia from coke oven gases, said process including the steps of:

forming ammonium sulfite salt solution by washing said coke oven gases containing ammonia with a washing liquid essentially including at least 15% by weight inorganic acidic ammonium bisulfite,

regenerating acidic ammonium bisulfite by washing the formed ammonium sulfite salt solution with gases bearing sulfur dioxide,

using a portion of the regenerated acidic ammonium bisulfite for continuous washing of ammonia from the coke oven gases while diverting a portion of the regenerated acidic ammonium bisulfite,

burning the diverted portion of the regenerated acidic ammonium bisulfite to recover gases essentially including sulfur dioxide, nitrogen and water vapor, and

using the sulfur dioxide for the recovered gases from said step of burning for said step of regenerating acidic ammonium bisulfite.

4,001,375

PROCESS FOR THE DESULFURIZATION OF FLUE GAS

John M. Longo, New Providence, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 21, 1974, Ser. No. 499,324

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C01B *7/00;* **B01J** *8/00*

U.S. Cl. 423—244 **7 Claims**

1. A process for the removal of sulfur oxides from a gas, which comprises the steps of contacting the gas with a cerium oxide sorbent at a temperature of from 300° to 800°C until the cerium oxide sorbs sulfur oxide, and regenerating the spent

sorbent by contacting with hydrogen wherein during regeneration the sulfur sorbed cerium is subsequently converted to cerium oxide and the desorbed sulfur specie is initially sulfur dioxide and subsequently hydrogen sulfide.

4,001,376

FLUE GAS DESULFURIZATION SORBENT AND PROCESS

Neville L. Cull, Baker, and Warren M. Smith, Baton Rouge, both of La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 315,590, Dec. 15, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 555,989

Int. Cl.² C01B *17/00*; B01J *8/00*

U.S. Cl. 423—244 **9 Claims**

1. In a process wherein sulfur dioxide is separated from a gaseous mixture containing the same by contacting said gaseous mixture, under desulfurization conditions, with a solid sorbent comprising a carrier and an active material supported thereon, which active material will selectively react with sulfur dioxide at said desulfurization conditions, the improvement wherein the carrier comprises alumina and from about 2 to about 20 wt. %., based on the weight of alumina, of a refractory metal oxide different from alumina, said refractory metal oxide being disposed at or near the surface of the alumina by first contacting said alumina with a hydrolyzable organic compound under anhydrous conditions and then converting said hydrolyzable compound to said refractory metal oxide different from alumina.

4,001,377

METHOD FOR PRODUCING STABILIZED AMMONIUM NITRATE

Heinrich Hahn, Gelsenkirchen-Buer; Hans Heumann, and Manfred Schweppe, both of Herne, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Oct. 17, 1974, Ser. No. 515,794

Claims priority, application Germany, Oct. 18, 1973, 2352304

Int. Cl.² C05C *1/02*

U.S. Cl. 423—267 **10 Claims**

1. A method for producing the stabilized ammonium nitrate from an aqueous solution of ammonium nitrate which consists essentially of reducing the water content of the aqueous ammonium nitrate solution so that the water is present in the amount of up to 0.2% by weight, thereafter adding to the ammonium nitrate composition an agent selected from the group consisting of ammonium polyphosphate and potassium polyphosphate in an amount of 0.1 to 1% by weight, based upon the weight of ammonium nitrate and thereafter forming the resultant composition into a prill by prilling.

4,001,378

ANTI-CAKING OF NITROGENOUS MATERIALS

John J. Jasnosz, Huntington Beach, Calif., assignor to Petrochemicals Company, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 421,248, Dec. 3, 1973, abandoned. This application Nov. 12, 1975, Ser. No. 631,111

Int. Cl.² C01B *21/48*; C05C *1/60*

U.S. Cl. 423—268 **11 Claims**

1. A composition of matter that flows freely and resists caking even on prolonged storage comprising particles of a nitrogen-containing material consisting essentially of ammonium salts useful as an ingredient of fertilizer and normally posing a problem with caking; said particles of said nitrogen-containing material having on their external surfaces an amount that is sufficient to reduce the normal caking tendency of the nitrogen-containing particles, of an alkene sulfonate in which the alkene moiety contains from 6–26 carbon atoms, inclusive; said particles of nitrogen-containing material also having on their external surface an amount that is sufficient to further reduce the caking thereof, of a finely divided inert material selected from the class consisting of magnesium carbonate, kieselguhr and clay, and having the properties of further reducing the caking.

4,001,379

PROCESS OF MAKING SUPERFINE AMORPHOUS HIGH STRUCTURAL SILICIC ACID

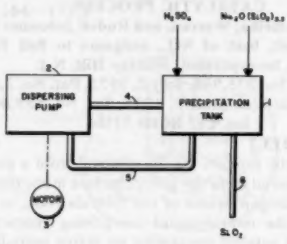
Günter Türk, Gross-Auheim, and Joseph Welsch, Neu-Isenburgh, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation of Ser. No. 199,054, Nov. 15, 1971, abandoned, which is a continuation of Ser. No. 849,739, April 28, 1969, abandoned. This application Sept. 21, 1972, Ser. No. 290,884

Claims priority, application Germany, Apr. 27, 1968, 1767332

Int. Cl.² C01B *33/18*, *33/12*

U.S. Cl. 423—339 **9 Claims**



1. A process for the production of a fine-grain, amorphous, high structure silicic acid comprising the steps of precipitating a silicic acid by heating an aqueous alkali-metal silicate solution to a temperature between 70° and 100° C, then adding an acid or an acidic-acting substance or a mixture of said acid and acidic-acting substance together with further alkali-metal silicate to the said heated solution, thus causing the mixture to pass first through an alkaline phase and then through an acid precipitation phase, whereby a gradual transition of the silicate to an intermediate hydrated silica sol and thereafter gradual conversion of the hydrated silica sol by flocculation to a silicic acid suspension occurs in said alkaline phase and these steps being carried out with the following provisions:

a. the alkali number of the reaction mixture is maintained substantially constant throughout the said alkaline precipitation phase at a value within the range from 10 to 40;
b. the amounts of components for the precipitation reaction are selected to obtain an SiO_2 end concentration above 65 grams SiO_2 per liter;
c. a dispersing and shearing force is applied to the mixture throughout the major part of the period of said gradual conversion of the intermediate hydrated silica sol to the flocculated silicic acid;
d. the said dispersing and shearing force is applied by passing the mixture in a continuous stream through a flow-through dispersing pump, centrifugal pump, or combination of these devices, the said pump operating at a frequency of at least 10 per hour, the said frequency being the ratio of the performance of the dispersing device expressed in cubic meters per hour to the initial volume of the reaction mixture in cubic meters; and
e. the said mixing, precipitation and suspension formation is carried out in a single reaction vessel.

4,001,380

MANUFACTURE OF NITROGEN TRIFLUORIDE

Joseph Gordon, Morris Township, Morris County, and Bernard Sukornick, Elizabeth, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 16, 1961, Ser. No. 111,130

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.[2] C01B *21/00, 9/08*

U.S. Cl. 423—406 10 Claims

1. The process for making nitrogen trifluoride which comprises introducing gaseous fluorine azide into a reaction zone containing fluorinating agent of the group consisting of nitrosyl fluoride and chlorine trifluoride, maintaining temperature in the reaction zone in the range of above the boiling point of fluorine azide and below about 100° C., and discharging from the reaction zone gaseous reaction products containing nitrogen trifluoride.

4,001,381

MANUFACTURING PROCESS FOR HEAVY SODIUM CARBONATES IN BRIQUETTE FORM

Aurelian M. Dascalescu, and Grigore O. Socolescu, both of Bucharest, Romania, assignors to Uzina De Produse Sodice, Ocna Mures, Romania

Continuation-in-part of Ser. No. 232,219, March 6, 1972, abandoned. This application July 20, 1973, Ser. No. 381,058

Claims priority, application Romania, Nov. 14, 1970, 54918

Int. Cl.[2] C01D *7/37, 7/38, 7/12*

U.S. Cl. 423—426 4 Claims

1. A process for the manufacture of heavy sodium carbonate briquettes, which comprises the steps of drying a raw, light sodium carbonate - forming starting substance selected from the group consisting of sodium bicarbonate and a mixture of sodium sesquicarbonate and sodium carbonate monohydrate to a 2–4% moisture content, subjecting the thus-dried starting substance to a pressure of about 800 kg/cm^2 to produce briquettes of the same starting substance having a density of approximately 1.8 kg/dm^3, and then calcining the thus-formed dense briquettes of the starting substance in a closed space heated to a temperature of 700°–750° C for a time period sufficient to convert the dense briquettes of said starting substance into briquettes of heavy sodium carbonate having a density of 2.2–2.4 kg/dm^3 and to simultaneously evolve a dust-free gas mixture of CO_2 and H_2O vapors.

4,001,382

PROCESS FOR PRODUCING CARBON FIBERS HAVING EXCELLENT PHYSICAL PROPERTIES

Yasuo Matsumura; Soichiro Kishimoto, and Saburo Okazaki, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Japan

Filed Jan. 20, 1975, Ser. No. 543,008

Claims priority, application Japan, Feb. 4, 1974, 49-14209

Int. Cl.[2] C01B *31/07*

U.S. Cl. 423—447.1 10 Claims

1. In a process for producing carbon fibers having a high strength and a high modulus of elasticity which comprises heating acrylonitrile copolymer fibers made from an acrylonitrile copolymer containing at least 80 mole % acrylonitrile, the improvement wherein the acrylonitrile copolymer contains 0.3 to 6 mole % of an unsaturated carboxylic acid and its alkali metal or ammonium salt, and the content of the carboxylic groups in the salt form in the fiber is 0.1 to 15% based on the total amount of carboxyl groups and their salts in the fiber.

4,001,383

IMPURE SULFURIC ACID TREATMENT PROCESS

Alfred W. Petersen, Salt Lake City, Utah, assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 171,365, Aug. 12, 1971, abandoned, which is a division of Ser. No. 812,124, April 1, 1969, abandoned. This application July 25, 1975, Ser. No. 599,231

Int. Cl.[2] C01B *17/90, 17/72, 25/16*

U.S. Cl. 423—531 2 Claims

1. A process for removing non-degradable organic matter in spent sulfuric acid comprising mixing about 90:10 percent by weight of said acid with about 10:90 percent by weight of spent sulfuric acid containing carbon formed by thermally-degraded organic matter.

4,001,384

PROCESS FOR RECOVERY OF OXIDES OF SULFUR FROM COMBUSTION WASTE GAS

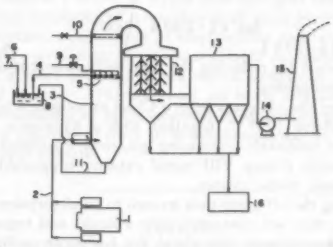
Junji Iwakura, Amagasaki; Kimihiko Sato, Yokohama; Hisashi Fujii, Amagasaki; Yoshihiro Hashimoto, Daito; Shigeo Ono, Yokohama; Shozaburo Watanabe, Amagasaki, and Akio Yokoyama, Nishinomiya, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed May 29, 1973, Ser. No. 364,416

Claims priority, application Japan, Aug. 1, 1972, 47-76474

Int. Cl.[2] C01D *5/00;* C01B *17/60*

U.S. Cl. 423—551 8 Claims



1. A process for the recovery of oxides of sulfur from oxygen containing combustion waste gases, which comprises:

cooling said waste gases having an initial temperature of 400° – 600° C and forming entrained articles of sodium compounds consisting essentially of sodium carbonate, by spray contacting said waste gases with a solution of sodium hydroxide or sodium carbonate, wherein the ratio of said sodium hydroxide or sodium carbonate to said oxides of sulfur is 0.9 to 1.5;

converting sodium carbonate in the particles to sodium sulfate by passing said waste gases containing said oxides of sulfur and said sodium compound particles over plate-like packings, whereby said particles are comminuted to a finer particle size form, so as to enhance the reaction of said particles with the oxides of sulfur in said waste gases; and

collecting entrained particles after said conversion step in a dust collector.

4,001,385

SULFUR RECOVERY SYSTEM

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 230,525, Feb. 29, 1972, abandoned. This application June 21, 1974, Ser. No. 481,778

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—573 G 5 Claims

1. In the process of oxidizing hydrogen sulfide gas with an

oxygen containing gas in the presence of an aqueous medium at a neutral or acid pH and a solid heterogenous catalyst to form elemental sulfur, the improvement comprising:

reacting said hydrogen sulfide gas and said oxygen containing gas in a reaction chamber filled with said aqueous medium and said solid heterogeneous catalyst in particulate form, said solid catalyst being carbon particles which are relatively free from chemical attack by the reactants and the reaction products, said carbon particles having surface portions in contact with a hydrophobic material selected from the group consisting of polystyrene, polytetrafluoroethylene, polyethylene, silicones, polychlorotrifluoroethylene, prepolymerized silicone oils, high vacuum silicone grease, poly (chloro-p-xylylene), paraffin, paratoluene sulfonamide, polydichlorodifluorethylene and octadecyl amine without being completely encapsulated by or encapsulating said hydrophobic material.

4,001,386

PROCESS FOR H_2S REMOVAL EMPLOYING A REGENERABLE POLYALKANOLAMINE ADSORBENT

Johannes P. Klein, The Hague, Netherlands; Swethadrivas R. Setlur, New Delhi, India, and Willem Groenendaal, The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 465,445, April 29, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,956

Claims priority, application United Kingdom, Mar. 1, 1973, 9931/73

Int. Cl.² C01B *17/00*

U.S. Cl. 423—574 L **6 Claims**

1. A process for reducing the total sulfur content of Claus off-gases comprising

A. passing the off-gases from a Claus process at a temperature above 175° C, together with a hydrogen- and/or carbon monoxide-containing gas, over a sulfided Group VI and/or Group VIII metal catalyst supported on an inorganic oxidic carrier,

B. passing the off-gases thus treated to an absorption step in which they are contacted with a liquid and regenerable polyalkanolamine absorbent for hydrogen sulfide, discharging the unabsorbed portion of the said off-gases, optionally after incineration, into the atmosphere, and producing a hydrogen sulfide-enriched polyaklanolamine absorbent emanating from the absorption step,

C. increasing the hydrogen sulfide content of the hydrogen sulfide-enriched polyalkanolamine absorbent emanating from the absorption step by contacting said hydrogen sulfide-enriched absorbent with a stream which contains hydrogen sulfide at a higher partial pressure than that of the said reduced Claus off-gases,

D. regenerating the hydrogen sulfide-enriched absorbent from step C by heating and/or stripping and using it again for further absorption of hydrogen sulfide, and

E. passing the hydrogen sulfide liberated in the regeneration to a Claus process.

4,001,387

PROCESS FOR PREPARING RADIOPHARMACEUTICALS

Morton Barak, Walnut Creek, and Harry S. Winchell, Lafayette, both of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Division of Ser. No. 383,797, July 30, 1973, Pat. No. 3,902,849, which is a continuation-in-part of Ser. No. 173,099, Aug. 19, 1971, Pat. No. 3,749,556. This application Jan. 2, 1975, Ser. No. 537,930

Int. Cl.² A61K *43/00*

U.S. Cl. 424—1 **7 Claims**

1. A process for making a technetium-99m labeled pharmaceutical comprising:

selectively adsorbing and simultaneously reducing technetium-99m pertechnetate upon a particulate reducing agent comprising a metal more electronegative than hydrogen and eluting the reduced technetium-99m from said reducing agent

by combination with a physiologically benign chelating agent for reduced technetium-99m dispersed in a physiologically benign liquid carrier having an initially acidic pH.

4,001,388

OPHTHALMOLOGICAL BIOERODIBLE DRUG DISPENSING FORMULATION

John W. Shell, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 369,916, June 14, 1973, Pat. No. 3,914,402. This application July 2, 1975, Ser. No. 592,555

Int. Cl.² A61K *9/14, 9/22, 9/32*

U.S. Cl. 424—14 **5 Claims**

1. An ophthalmic dosage form comprising solid particles of an ophthalmic drug within a bioerodible release rate-controlling material formed of a polyester of the general formula:

$$-[\text{-O-(W)-CO-}]_n-$$

wherein W is a lower alkylene of 1 to 7 carbons and Y has a value such that the molecular weight of the polymer is from about 4,000 to 100,000 mixed with a member for improving ocular compatability of the dosage selected from the group consisting of cellulose and cellulose ethers, said particles consisting of up to 20 parts drug to about 1 part rate controlling material to about 1 part drug up to about 30 parts rate controlling material with the particles having a thickness of rate controlling material that improves release of drug and being from 10 to 300 microns in largest dimensions and forming a bland and non-irritating suspension of 1 part up to 50 parts when admixed prior to administration to the eye with up to 100 parts of an opthalmically acceptable carrier having a pH acceptable to the eye, and wherein ophthalmic drug is released when the dosage is in the eye as the particles erode in response to the ocular environment at a controlled and continuous rate over a prolonged period of time.

4,001,389

SLOW RELEASE BIOLOGICALLY ACTIVE MATERIALS FOR FEEDING TO RUMINANT ANIMALS

Francis James Thomas Fildes, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 23, 1974, Ser. No. 508,715

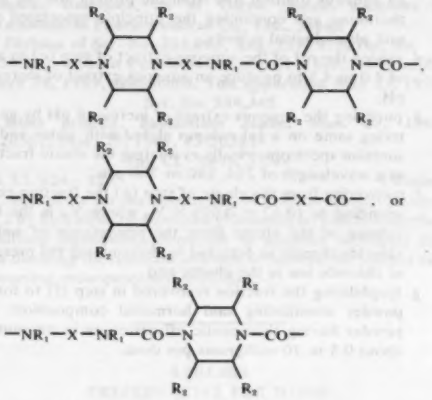
Claims priority, application United Kingdom, Sept. 26, 1973, 45089/73

Int. Cl.² A61K *9/22, 9/32*

U.S. Cl. 424—19 **14 Claims**

1. A biologically active composition suitable for feeding to a ruminant animal comprising a biologically active material coated with or in a matrix of a polymeric material, the poly-

meric material comprising amide repeat units having the structure



wherein the groups R_1, which may be the same or different, are hydrogen, or alkyl groups, the groups R_2, which may be the same or different, are hydrogen or alkyl groups and the groups X, which may be the same or different are selected from the group consisting of methylene, polymethylene and alkyl derivatives thereof, the proportion of nitrogen in the polymeric material derived from the amino groups in the piperazine groups being in the range of from 2% to 10% by weight of the polymeric material and the molecular weight of the polymeric material is such that the polymeric material has a reduced viscosity of at least 0.3 dl g^{-1} when measured in a 1% by weight solution in methanol containing 5% by weight of lithium chloride at 25° C.

4,001,390

METHOD OF COATING PHARMACEUTICAL SOLID DOSAGE FORMS

Shigeru Ohno, Kamakuna; Fujio Sekigawa, Yono, and Shokichi Yamagishi, Omiya, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1975, Ser. No. 563,979

Claims priority, application Japan, Apr. 4, 1974, 49-38128

Int. Cl.² A61K *9/32, 9/36*

U.S. Cl. 424—35 **3 Claims**

1. A pharmaceutical solid dosage form coated with three successive layers comprising:

1. an inside layer closest to said solid dosage form containing no pigment and consisting of hydroxy propylmethyl cellulose or hydroxy propylmethyl cellulose phthalate;
2. a layer over layer (1) consisting of said polymer and a pigment; and
3. an outer layer over layer (2) consisting of said polymer and up to 10 weight percent pigment based on the weight of said polymer.

4,001,391

MEANS FOR DEPOSITING AEROSOL SPRAYS IN BUTTERY FORM

Wolffe Harry Feinstone, and Fred J. Bandelin, both of Memphis, Tenn., assignors to Plough, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 817,572, April 18, 1969, abandoned. This application Sept. 16, 1971, Ser. No. 181,208

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² A61K *7/00, 7/42, 9/12;* **B65D** *83/14*

U.S. Cl. 424—45 **10 Claims**

1. An aerosol package for spraying a cosmetic or pharmaceutical substance such that it deposits on a desired limited surface area of living skin tissue in the form of a buttery, liquescent solid comprising a pressure-resistant container; actuatable aerosol spray valve means for hermetically sealing said container and regulating the passage of material therethrough such that it leaves the terminal orifice as a finely divided spray, said container housing an anhydrous cosmetically or pharmaceutically acceptable, oleaginous base containing said substance; a wax in an amount of about 5 to 50% by weight of the base, said wax being a paraffin wax having a melting point in the range of 120° to 150°F.; and an effective amount of a propellant miscible with said base.

4,001,392

HAIRDRESSINGS

Kenneth Vasey Curry, Camberley, and Ahamado Ismail Sahir, Isleworth, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 21, 1970, Ser. No. 4,761

Claims priority, application United Kingdom, Jan. 31, 1969, 5431/69

Int. Cl.² A61K *7/11*

U.S. Cl. 424—47 **8 Claims**

1. A hairdressing composition for holding and imparting lustre to the hair comprising from 10 to 70% of a lower aliphatic alcohol having from 1 to 4 carbon atoms; up to 40% water; from 0.1 to 5% of a film-forming agent selected from the group consisting of a copolymer of vinyl pyrrolidone and vinyl acetate, a copolymer of vinyl acetate and crotonic acid, polyvinyl pyrrolidone and a water soluble neutralized copolymer of a vinyl alkyl ether and maleic anhydride; and, from about 2 to about 30% of a lustre aid being selected from the group consisting of polyethylene-polypropylene glycol ether having a viscosity of from 10 to 400 centistokes at 100° F and diisopropyl adipate.

4,001,393

MEANS FOR CARIES PROPHYLAXIS

Raul L'Orange, Mainz, Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Germany

Filed Jan. 9, 1974, Ser. No. 431,856

Claims priority, application Germany, Jan. 20, 1973, 2302812

Int. Cl.² A61K *7/18, 7/22*

U.S. Cl. 424—52 **10 Claims**

1. A composition effective in preventing caries comprising a non-toxic carrier substance and a caries-prophylactic amount of a member selected from the group consisting of 1,6-di-4'-fluorophenyldiguanidohexane, its non-toxic salts and mixtures thereof.

4,001,394

SHAMPOO CREME RINSE CONTAINING A QUATERNARY AMMONIUM SACCHARINATE, CYCLAMATE OR PHTHALIMIDATE

Arnold W. Fogel, Montvale, and Anthony F. Mercurio, Rivervale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

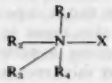
Filed Jan. 30, 1974, Ser. No. 438,048

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² A61K *7/06*

U.S. Cl. 424—70 **8 Claims**

1. A shampoo, creme rinse composition comprising, an aqueous carrier, an anionic or amphoteric detergent, or a combination thereof, the total amount of detergent being from about 10 to 55 parts, and from 0.1 to 1 part of a substituted quaternary ammonium compound represented by the formula:



where R_1 and R_2 are lower alkyl of 1 to 4 carbon atoms:

R_3 is a benzyl radical which may be further substituted by a C_1 or C_2 alkyl radical;

R_4 is a long chain alkyl radical of 16 to 22 carbon atoms; and

X is an organic anion selected from the group consisting of a saccharinate, a cyclamate and a phthalimidate radical said parts being per 100 parts of composition.

4,001,395

HYDROSOLUBLE EXTRACTS OF MYCOBACTERIA

Pierre Jolles, Paris, and Daniéle Migliore-Samour, Kremlin-Bicetre, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation-in-part of Ser. No. 371,658, June 19, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,477

Claims priority, application France, June 20, 1972, 72.22208; May 4, 1973, 73.16130; Sept. 4, 1974, 74.30107

Int. Cl.² A61K *39/00, 39/02*

U.S. Cl. 424—92 **15 Claims**

1. A process for the preparation of hydrosoluble extracts of delipidated mycobacteria, said extracts having a molecular weight in the range of about 3,500 to 20,000, said process consisting essentially of subjecting the bacterial residues of said delipidated mycobacteria to a treatment with pyridine, extracting with a solvent selected from the group consisting of alcohol and water, and isolating hydrosoluble substances from the extract by physicochemical means.

4,001,396

HORMONAL PRODUCT EXTRACTED FROM PARATHYROID GLAND AND PROCESS FOR THE PREPARATION THEREOF

Laszlo Feuer, Budapest, Hungary, assignor to Chinoin Pharmaceutical and Chemical Works Ltd., Budapest, Hungary

Continuation-in-part of Ser. No. 274,723, July 24, 1972, abandoned. This application Apr. 3, 1974, Ser. No. 457,627

Claims priority, application Hungary, Aug. 4, 1971, CI 1146

Int. Cl.² A61K *35/46*

U.S. Cl. 424—112 **4 Claims**

1. A method of making a hormonal composition distinguished from parathormone in that it has a molecular weight of between 200 and 1000 and a physiological activity different from parathormone, said composition being effective in the treatment of:

Skin radiation damage,

said method comprising the steps of:

a. degreasing ground, lyophilized, protein-containing parathyroid gland powder or powder derived from tissual or cell culture of the parathyroid gland in acetone or chloroform to produce a degreased gland powder;

b. extracting the degreased gland powder produced in step (a) with water to form an aqueous extract containing the principle associated with said physiological activity;

c. treating the aqueous extract formed in step (b) with trichloroacetic acid to precipitate the protein therefrom and to remove parathormone contained therein to yield an aqueous solution free from the protein and the parathormone and containing the principle associated with said physiological activity;

d. raising the pH of the aqueous extract of step (c) to a pH of 4.0 to 4.5 to produce an aqueous extract of increased pH;

e. purifying the aqueous extract of increased pH by gel-filtering same on a gel column eluted with water and absorption spectrometrically evaluating the eluate fractions at a wavelength of 234, 280 or 300 μm;

f. recovering from the eluate of step (e) the fraction corresponding to $(0.67 \pm 0.02) \times V_o$ where V_o is the total volume of the eluate from the appearance of sodium chloride therein as detected by determining the presence of chloride ion in the eluate; and

g. lyophilizing the fraction recovered in step (f) to form a powder constituting said hormonal composition, said powder having therapeutic effectiveness in amounts of about 0.5 to 10 milligrams per dose.

4,001,397

ANTIBIOTIC COMPOUND 41,012

Walter D. Celmer, New London; Charles E. Moppett, Mystic; Walter P. Cullen, East Lyme; John B. Routien, Lyme; Mark T. Jefferson, Waterford, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,366

Int. Cl.² A61K *35/74*

U.S. Cl. 424—116 **2 Claims**

1. The Antibiotic Compound 41,012 which in the form of the free acid is soluble in water, ethanol, water saturated n-butanol, dimethylformamide or dimethylsulfoxide and insoluble in heptane, diethyl ether, chloroform or methylene chloride; has an optical rotation of $[\alpha]_D^{25°} = -7.1°$ at a concentration of 1% in methanol; has an average composition by weight of 44.81% carbon, 6.56% hydrogen, 9.55% nitrogen and 39.08% oxygen (by difference); and when pelleted in KBr exhibits characteristic absorption in the infrared region at the following wavelengths in microns: 3.00, 3.48, 5.80, 5.93, 6.07, 6.55, 6.92, 7.25 and 8.10.

4,001,398

OCTAHYDRO AND DECAHYDRO DERIVATIVES OF ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

David T. Connor, Parsippany; Samuel M. Ringel, Rockaway; Sidney Roemer, Flanders, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 24, 1974, Ser. No. 482,058

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² A61K *35/00*

U.S. Cl. 424—122 **14 Claims**

1. An antimicrobial substance, octahydroacid S, prepared by treating octahydroacid S methyl ester (1 equivalent) with 5 percent aqueous sodium hydroxide solution (50 equivalents) for 30 minutes at 100° and having the following characteristics:

a. Molecular Formula $C_{28}H_{50}O_8$; molecular weight 482.

b. Infrared Spectrum ν_{max} 3350, 1720, 1460, 1380, 1080 and 720 cm^{-1}.

4,001,399

PROCESS FOR THE PRODUCTION OF MONOPROPIONYL-JOSAMYCIN-2

Takashi Osono; Kiruko Moriyama; Keisuke Murakami, and Hamao Umezawa, all of Tokyo, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Japan

Division of Ser. No. 282,013, Aug. 21, 1972, Pat. No. 3,959,252, which is a continuation-in-part of Ser. No. 811,346, March 28, 1969, abandoned. This application May 23, 1975, Ser. No. 580,345

Claims priority, application Japan, Mar. 29, 1968, 43-20381; Mar. 29, 1968, 43-20382

Int. Cl.² A61K *33/44*

U.S. Cl. 424—123 **7 Claims**

1. A process for the production of monopropionyl-josamycin-2 by hydrolysis of dipropionyl-josamycin, which comprises dissolving dipropionyl-josamycin in aqueous methanol and then distilling the resultant solution to remove the solvent and recovering monopropionyl-josamycin-2.

4,001,400

PRESERVATIVE FOR WOOD

Bror Olof Hager, Djursholm, Sweden, assignor to Hager Aktiebolag, Stockholm, Sweden

Filed Jan. 17, 1972, Ser. No. 218,546

Claims priority, application Sweden, Jan. 26, 1971, 880/71

Int. Cl.² A01N *13/00*

U.S. Cl. 424—134 **10 Claims**

1. Preservative for wood and other organic fiber products consisting essentially of a copper compound and a fatty acid having from 6 to 12 carbon atoms per molecule dissolved in an aqueous ammoniacal solution.

4,001,401

BLOOD SUBSTITUTE AND BLOOD PLASMA EXPANDER COMPRISING POLYHEMOGLOBIN

Pieter Bonsen, Los Altos, Calif.; Myron B. Laver, Weston, Mass., and Kent C. Morris, Mountain View, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Feb. 27, 1975, Ser. No. 553,514

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.² A61K *37/04, 35/14*

U.S. Cl. 424—177 **20 Claims**

1. A pharmaceutical composition useful as a blood substitute and blood plasma expander comprising a therapeutically effective amount of cross-linked, stromal-free hemoglobin, soluble in aqueous and physiological fluids, capable of reversibly binding a ligand and having a molecular weight of 64,000 to 1,000,000, mixed with a pharmaceutically acceptable carrier.

4,001,402

CARDENOLIDE GLYCOSIDES AND METHOD OF MAKING THE SAME, AND THERAPEUTIC COMPOSITION

Hans Peter Albrecht, Luetzelsachsen ueber Weinheim, and Guenter Neugebauer, Mannheim, both of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany

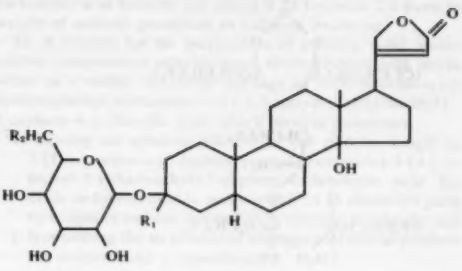
Filed Apr. 5, 1976, Ser. No. 673,592

Claims priority, application Germany, Apr. 18, 1975, 2517293

Int. Cl.² A61K *31/705*

U.S. Cl. 424—182 **8 Claims**

1. A cardioactive glycoside of the formula



wherein R_1 is saturated aliphatic hydrocarbon having 1 – 4 carbon atoms or unsaturated aliphatic hydrocarbon having 2 – 4 carbon atoms or phenyl and R_2 is hydrogen or hydroxyl.

8. A pharmaceutical composition containing a cardioactively effective amount of a compound as i claim 1 as an active ingredient, in combination with a pharmaceutical excipient.

4,001,403

METHOD FOR REDUCING THE REPRODUCTIVE FUNCTION OF MAMMALS

Donald R. Bennett, Midland, Mich., and James A. McHard, Gainesville, Fla., assignors to Dow Corning Corporation, Midland, Mich.

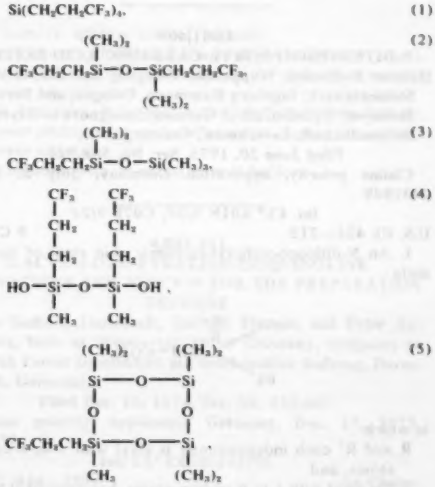
Continuation-in-part of Ser. No. 743,602, July 10, 1968, abandoned. This application Mar. 16, 1973, Ser. No. 342,227

Int. Cl.² A61K *31/695*

U.S. Cl. 424—184 **9 Claims**

1. A method for reducing the reproductive function of mammals which comprises administering a pharmacologically effective amount of a certain fluoroalkyl-substituted oganosilicon compound to a mammal, said compound being selected from the group consisting of

(1) $Si(CH_2CH_2CF_3)_4$,



(1) $Si(CH_2CH_2CF_3)_4$,

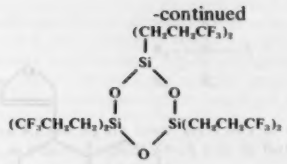
(2) $CF_3CH_2CH_2Si(CH_3)_2OSi(CH_3)_2OSi(CH_3)_2CH_2CH_2CF_3$,

(3) $CF_3CH_2CH_2Si(CH_3)_2OSi(CH_3)_3$,

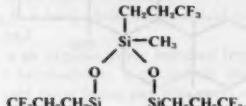
(4) $HO[Si(CH_3)_2CH_2CH_2CF_3O]_2H$,

(5) $CF_3CH_2CH_2Si(CH_3)_2O[Si(CH_3)_2O]_2Si(CH_3)_2CH_2CH_2CF_3$.

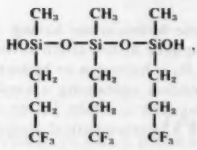
-continued



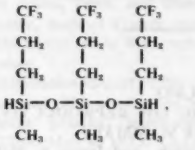
(6)



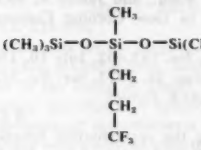
(7)



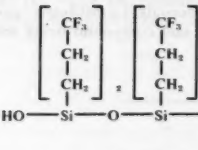
(8)



(9)



(10)



and

(11)

4,001,404

N-DITHIOPHOSPHORYL-CARBAMIC ACID ESTERS

Hellmut Hoffmann, Wuppertal; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

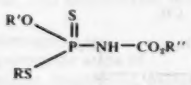
Filed June 20, 1975, Ser. No. 588,921

Claims priority, application Germany, July 2, 1974, 2431849

Int. Cl.² A01N 9/36; C07F 9/24

U.S. Cl. 424—212 **9 Claims**

1. An N-dithiophosphoryl-carbamic acid ester of the formula



in which

R and R' each independently is alkyl with 1 to 6 carbon atoms, and

R'' is alkyl with 1 to 6 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms or dialkylaminoalkyl with 1 to 4 carbon atoms in each alkyl moiety.

7. An insecticidal or acaricidal composition containing as active ingredient an insecticidally or acaricidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,001,405

PHOSPHONATE SYNERGISTS

Peter E. Letchworth, Cupertino, Calif., and Edward D. Weil, Hastings-on-Hudson, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 427,160, Dec. 21, 1973, abandoned, which is a continuation of Ser. No. 158,542, June 30, 1971, abandoned. This application Mar. 26, 1975, Ser. No. 562,368

Int. Cl.² A01N 9/36

U.S. Cl. 424—210 **2 Claims**

1. An insecticidal composition comprising an insecticidally effective amount of an insecticidal compound consisting of O,O-dimethyl-O-(2-methoxy-4-cyanophenyl)-phosphorothioate and a synergistic amount of a synergist compound consisting of O,O'-dipropargyl chloromethylphosphonate; said compounds being present in an amount of about 1 part insecticidal compound to about 0.1 to 10 parts synergist compound.

4,001,406

BENZENEDISULFONAMIDES AS ANTHELMINTIC AGENTS

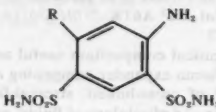
Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 477,542, June 2, 1974, abandoned, which is a division of Ser. No. 359,393, May 11, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,638

Int. Cl.² A61K 31/63

U.S. Cl. 424—228 **5 Claims**

1. A method for curing fascioliasis which comprises administering to an animal so infected a fasciolicidally effective amount of a compound having the formula:



wherein R is a haloalkyl group of from 2 to 6 carbon atoms containing from 1 to 13 halogen atoms.

4,001,407

REDUCTION OF SERUM LIPID LEVELS AND AGENTS AND COMPOSITIONS USEFUL THEREFOR

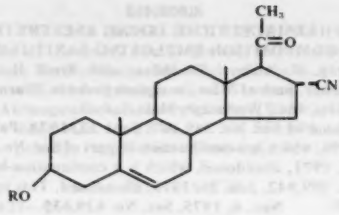
Wendell H. Rooks, II, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 417,972, Nov. 21, 1973, which is a continuation-in-part of Ser. No. 315,997, Dec. 18, 1972. This application Nov. 5, 1975, Ser. No. 629,173

Int. Cl.² A61K 31/56

U.S. Cl. 424—238 **15 Claims**

1. A method for lowering elevated serum lipid concentrations comprising administering to a mammalian host a therapeutically effective amount of a compound selected from the group of compounds represented by the formula:



where R is hydrogen, alkyl having 1 to 6 atoms, cycloalkyl having 3 to 6 carbon atoms, acyl having 2 to 7 carbon atoms, tetrahydrofuran-2'-yl, tetrahydropyran-2'-yl, or 4'-alkoxy-tetrahydropyran-4'-yl where the alkoxy moiety has 1 to 6 carbon atoms.

4,001,408

SUBSTITUTED HETEROCYCLIC COMPOUNDS, PROCESSES AND COMPOSITION INCLUDING THOSE

Silvano Rossi, Milan, Italy, assignor to Roussel-UCLAF, Paris, France

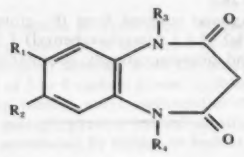
Division of Ser. No. 41,757, June 3, 1970, which is a continuation of Ser. No. 689,810, Dec. 12, 1969, abandoned. This application July 27, 1972, Ser. No. 276,242

Claims priority, application Italy, Dec. 14, 1966, 31085/66

Int. Cl.² A61K *31/33*

U.S. Cl. 424—244 **8 Claims**

1. A therapeutic composition having tranquilizing anti-convulsive and analgesic properties which comprises a pharmaceutically acceptable carrier and a small but effective amount of a compound having the formula



wherein R_1 is halogen, hydroxyl, methoxyl or carboxyl esterified with an alkanol having 1 to 3 carbon atoms when R_2 is hydrogen, R_2 is hydrogen, phenylloweralkyl, loweralkenyl, or (cycloalkyl)loweralkyl, said cycloalkyl having 3 to 7 ring carbon atoms and R_4 is methyl; and wherein R_1 is hydrogen, when R_2 is hydrogen, halogen, hydroxyl, methoxyl, or carboxyl esterified with an alkanol having 1 to 3 carbon atoms, R_3 is hydrogen, phenylloweralkyl, loweralkenyl, (cycloalkyl)-loweralkyl, said cycloalkyl having 3 to 7 ring carbon atoms, or alkyl having 1 to 6 carbon atoms, and R_4 is phenyl.

4,001,409

INJECTABLE FORMULATIONS OF 7-[D-α-AMINO-α-(P-HYDROXYPHENYL)ACETAMIDO]-3-(1,2,3-TRIAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

Alphonse Peter Granatek, Baldwinsville, and Murray Arthur Kaplan, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,268

Int. Cl.² A61K *31/54*

U.S. Cl. 424—246 **21 Claims**

1. A stable, solid, water-soluble antibiotic composition for reconstitution upon addition of sterile water as a stable injectable solution of 7-[D-α-amino-α-(p-hydroxyphenyl-)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid, said composition comprising a mixture of one part by weight of 7-[D-α-amino-α-(p-hydroxyphenyl-)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid hydrate and about 0.25 to about 2.0 parts by weight of sodium, potassium or calcium levulinate.

11. A process for the preparation of a stable, solid, water-soluble composition suitable upon reconstitution with sterile water as a stable injectable solution of 7-[D-αamino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid; which process comprises

1. forming an aqueous solution of one part by weight of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid hydrate or hydrochloride and about 0.25 to about 2.0 parts by weight of sodium, potassium or calcium levulinate; and
2. lyophilizing the so-produced aqueous solution to produce the desired solid composition.

4,001,410

3-AMINO-1,2,4-BENZOTRIAZINE-1,4-di-N-OXIDE COMPOSITIONS AND METHOD OF USING SAME

Kurt Ley, Odenthal-Globusch; Florin Seng, Schildgen, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

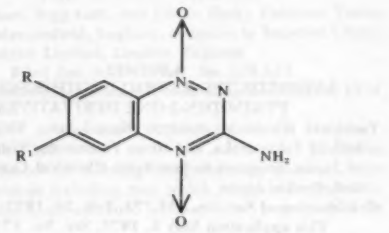
Division of Ser. No. 465,165, April 29, 1974, which is a division of Ser. No. 326,389, Jan. 24, 1973, Pat. No. 3,868,371. This application June 9, 1975, Ser. No. 584,910

Claims priority, application Germany, Feb. 1, 1972, 2204574

Int. Cl.² A61K *31/53*

U.S. Cl. 424—249 **28 Claims**

1. A composition useful for promoting the growth of animals which comprises a growth promoting amount of a compound of the formula:



or an isomeric mixture thereof, wherein

R is hydrogen, halogeno, lower alkyl, halo(lower alkyl), lower alkoxy, carbamyl, sulfonamido carboxy or carbo(-lower alkoxy), and

R^1 is hydrogen, halogeno, lower alkyl, halo(lower alkyl), lower alkoxy, carbamyl, sulfonamido, carboxy or carbo(-lower alkoxy),

in combination with an edible animal fodder.

4,001,411

2-ACYL-4-OXO-PYRAZINO-ISOQUINOLINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Jürgen Seubert, Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

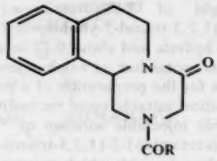
Filed Dec. 16, 1974, Ser. No. 533,467

Claims priority, application Germany, Dec. 17, 1973, 2362539

Int. Cl.² C07D *241/36*

U.S. Cl. 424—250 **16 Claims**

1. A compound of the formula



wherein R is (a) cycloalkyl of 3–7 carbon atoms, or a corresponding group mono-substituted by fluorine, chlorine, nitro, hydroxy, amino, formylamino, acetylamino, pentanoylamino, hexanoylamine, octanoylamine, oleoylamine, methoxyacetylamine, methylamine, dimethylamino or allylamino;

b. alkyl of up to 7 carbon atoms or a corresponding group substituted by methoxy or ethoxy; (c) oxocyclobutyl, oxocyclopentyl or oxocyclohexyl; or (d) cyclohexenyl; and the physiologically acceptable acid addition salts thereof.

15. A pharmaceutical composition consisting essentially of an anthelmintically effective amount per unit dosage of a compound of claim **1** in admixture with a pharmaceutically acceptable carrier.

16. A method of treating cestode and trematode infestations which comprises administering to an animal infested with cestodes or trematodes an anthelminitically effective amount of a compound of claim **1**.

4,001,412

1-SUBSTITUTED-1,2-DIHYDROTHIENO[2,3-d]-PYRIMIDIN-2-ONE DERIVATIVES

Toshiyuki Hirohashi, Ashiya; Hiromi Sato; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 335,775, Feb. 26, 1973, abandoned. This application May 6, 1975, Ser. No. 575,042

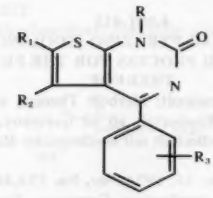
Claims priority, application Japan, Feb. 28, 1972, 47-20357

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.² C07D *495/04;* **A61K** *31/495*

U.S. Cl. 424—251 **13 Claims**

1. A thienopyrimidine derivative represented by the formula,



(I)

wherein R_1 is chlorine, methyl or nitro; R_2 is hydrogen or methyl; R_3 is hydrogen, chlorine or fluorine; and R is C_1-C_4 alkyl or cyclopropylmethyl.

4,001,413

PHARMACEUTICAL LOCAL ANESTHETIC COMPOSITION EMPLOYING SAXITOXIN

Herbert J. F. Adams, Westboro, and Bertil H. Takman, Worcester, both of Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

Division of Ser. No. 369,147, June 12, 1973, Pat. No. 3,957,996, which is a continuation-in-part of Ser. No. 206,182, Dec. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 109,942, Jan. 26, 1971, abandoned. This application Nov. 6, 1975, Ser. No. 629,633

Int. Cl.² A61K *31/52*

U.S. Cl. 424—253 **8 Claims**

1. An injectable local anesthetic composition having long-lasting local anesthetic effect which is a solution consisting essentially of a pharmaceutically acceptable carrier having dissolved therein

a. a heterocyclic aminoacyl anilide local anesthetic compound in a concentration of from 0.05% to 5% by weight of the carrier and

b. from 0.5 to 10 micrograms of saxitoxin per milliliter of the carrier.

4,001,414

1,3,4-TRIMETHYL-2-(3,4,5-TRIMETHOXYBENZYL)-1,2,5,6-TETRAHYDROPYRIDINE AND ANALGESIC COMPOSITION AND METHOD USING IT

Ricardo Granados Jarque; Juan Bosch Cartes; Jorge Canals Cabiro, all of Barcelona; Cristobal Martinez Roldan, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Spain

Filed Apr. 29, 1975, Ser. No. 572,863

Claims priority, application Spain, May 4, 1974, 425971

Int. Cl.² A61K *31/44;* **C07D** *211/70*

U.S. Cl. 424—263 **3 Claims**

1. The compound selected from the group consisting of 1,3,4-trimethyl-2-(3,4,5-trimethoxybenzyl)-1,2,5,6-tetrahydropyridine and pharmaceutically acceptable acid addition salts thereof.

4,001,415

COMPOSITION FOR AND METHOD OF TREATING DISEASES CAUSED BY PROTOZOA

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

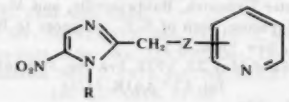
Division of Ser. No. 476,990, June 6, 1974, Pat. No. 3,905,985. This application Sept. 4, 1975, Ser. No. 610,459

Claims priority, application Germany, June 8, 1973, 2329376

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 **6 Claims**

1. A pharmaceutical composition for treatment of diseases caused by trichomonads and amebae, consisting essentially of an amount, effective against said trichomonads and amebae, an active compound of the formula



in which R stands for methyl, ethyl or hydroxyethyl and Z stands for —SO— or —SO_2— and the pyridine ring is linked to the sulfinyl or the sulfonyl group in 2, 3 or 4 position in admixture with a pharmaceutical carrier.

4,001,416
CERTAIN FUNGICIDAL PYRIDINES

Ernst-Heinrich Pommer, Limburgerhof; Bernd Zeeh, Ludwigshafen; Norbert Goetz, Bobenheim-Roxheim, and Bjoern Giergensohn, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

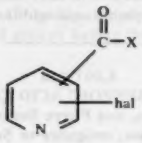
Filed Mar. 19, 1975, Ser. No. 559,686

Claims priority, application Germany, Apr. 9, 1974, 2417216

Int. Cl.² A01N 9/22

U.S. Cl. 424—266 9 Claims

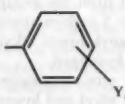
1. A process for combatting fungi which comprises treating the fungi or the crop plants to be protected against fungal attack with a fungicidal amount of a pyridine compound of the formula



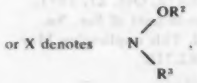
the two radicals hal and

being in ortho-position to each other, wherein hal denotes chloro, bromo or iodo and X denotes NH—R¹,

R¹ being a member selected from the group consisting of: cycloalkyl of 5 or 6 carbon atoms; cyclohexyl substituted by hydroxy, methyl, ethyl, isopropyl or ethynyl; phenyl; naphthyl; indanyl; pyridyl; pyridyl substituted by amino; pyrimidyl substituted by methyl or hydroxy; and the radical



in which *n* is one of the integers, 1, 2, 3 and 4 and Y is hydrogen, C_1 to C_4 alkyl, fluoro, chloro, bromo, iodo, hydroxy, amino, phenyl, C_1 to C_3 alkoxy, acetyl, benzoyl, trifluoromethyl, phenoxy, chlorophenoxy, hydroxycarbonyl, C_1 to C_4 alkoxycarbonyl, hydroxycarbonylmethyl or nitro;
or X denotes



R² being hydrogen or methyl and R³ being cyclohexyl.

4,001,417
METHOD FOR PRODUCING DIURESIS IN A MAMMAL BY USE OF THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

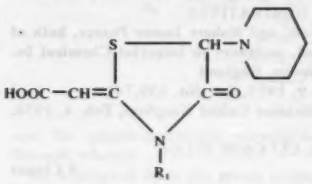
Division of Ser. No. 553,715, Feb. 27, 1975. This application Oct. 6, 1975, Ser. No. 619,992

Claims priority, application Germany, Mar. 25, 1974, 2414345

Int. Cl.² A61K 31/445

U.S. Cl. 424—267 9 Claims

1. A method for producing diuresis in a mammal in need thereof which comprises the administration of a compound of the general formula:



wherein R_1 is a lower alkyl radical containing 1 to 4 carbon atoms in an effective amount to cause diuresis.

4,001,418
1'-SUBSTITUTED-THIOXANTHENE-9-SPIRO-4'-PIPERIDINE DERIVATIVES AND THE 10-OXIDES AND 10,10-DIOXIDES THEREOF

Ronald Hilson Begg Galt, and Edwin Harry Paterson Young, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

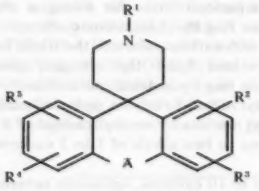
Filed Jan. 9, 1975, Ser. No. 539,627

Claims priority, application United Kingdom, Feb. 4, 1974, 5017/74

Int. Cl.² C07D 409/04

U.S. Cl. 424—267 10 Claims

1. A method of relieving or preventing pain in warm blooded animals including man which comprises administering an analgesically-effective amount of a compound of the formula:



I

wherein R¹ is selected from the group consisting of

1. hydrogen;
2. alkyl of 1 to 10 carbons;
3. alkenyl of 3 to 10 carbons wherein the double bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least 1 carbon;
4. cycloalkylalkyl of 4 to 7 carbons optionally substituted in the cycloalkyl nucleus by an aryl of 6 to 10 carbons or by one or two alkyls of 1 to 3 carbons;
5. aroylalkyl of 8 to 12 carbons optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons; and
6. hydroxyalkyl of 2 to 5 carbons wherein the oxygen atom

it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbon atoms;

R^2, R^3, R^4 and R^5, which may be the same or different, are selected from the group consisting of

7. hydrogen;
8. halogen;
9. alkyl of 1 to 5 carbons;
10. haloalkyl of 1 to 5 carbons;
11. alkoxy of 1 to 5 carbons;
12. alkylthio of 1 to 5 carbons;
13. alkanoyloxy of 1 to 5 carbons;
14. hydroxyalkyl of 1 to 5 carbons; and
15. hydroxy;

A stands for sulphur, sulphinyl or sulphonyl; and the pharmaceutically-acceptable acid-addition salts thereof.

4,001,419
1'-SUBSTITUTED XANTHENE-9-SPIRO-4'-PIPERIDINE DERIVATIVES

Ronald Hilson Begg Galt, and Robert James Pearce, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

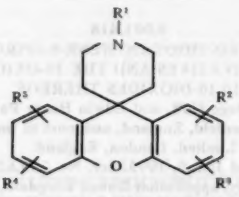
Filed Jan. 9, 1975, Ser. No. 539,742

Claims priority, application United Kingdom, Feb. 4, 1974, 5016/74

Int. Cl.² C07D *405/04*

U.S. Cl. 424—267 **8 Claims**

1. A method of relieving or preventing pain in warm blooded animals including man, which comprises administering an analgesically-effective amount of a compound of the formula:



wherein R^1 is selected from the group consisting of

1. hydrogen;
2. alkyl of 1 to 10 carbons;
3. alkenyl of 3 to 10 carbons wherein the double bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least one carbon;
4. haloalkenyl of 3 to 6 carbons wherein the double bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least one carbon;
5. alkynyl of 3 to 6 carbons wherein the triple bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least one carbon;
6. cycloalkylalkyl of 4 to 7 carbons, optionally substituted in the cycloalkyl nucleus by an aryl radical of 6 to 10 carbons or by one or two alkyls of 1 to 3 carbons;
7. phenyl;
8. arylalkyl of 7 to 10 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons;
9. aroylalkyl of 8 to 12 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons;
10. hydroxyalkyl of 2 to 5 carbons wherein the oxygen atom it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbons;
11. dialkylaminoalkyl of 4 to 8 carbons wherein the nitrogen atom it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbons;
12. carbamoylalkyl of 2 to 8 carbons;
13. alkylcarbamoylalkyl of 3 to 8 carbons;
14. dialkylcarbamoylalkyl of 4 to 8 carbons; and
15. alkanoylalkyl of 3 to 8 carbons; R^2, R^3, R^4 and R^5, which may be the same or different, are selected from the group consisting of
16. hydrogen;
17. halogen;
18. alkyl of 1 to 5 carbons;
19. haloalkyl of 1 to 5 carbons;
20. alkoxy of 1 to 5 carbons;
21. alkylthio of 1 to 5 carbons;
22. hydroxy;
23. thiol;
24. alkanoylamino of 1 to 5 carbons;
25. alkanoyloxy of 1 to 5 carbons;
26. aroyloxy of 7 to 10 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons;
27. arylalkenoyloxy of 9 to 12 carbons;
28. hydroxyalkyl of 1 to 5 carbons;
29. alkylsulphinyl of 1 to 5 carbons; and
30. alkanesulphonyloxy of 1 to 5 carbons; and the pharmaceutically-acceptable acid-addition salts thereof.

4,001,420
THIAZOLYL BENZOIC ACID COMPOUNDS

Charles Malen, Fresnes, and Pierre Desnoyers, Fontenay-aux-Roses, both of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medical, Suresnes, France

Division of Ser. No. 881,590, Dec. 2, 1969, Pat. No. 3,821,237. This application Apr. 25, 1974, Ser. No. 463,912

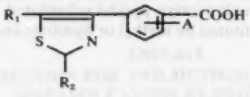
Claims priority, application United Kingdom, Dec. 12, 1968, 59720/68

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 **9 Claims**

1. A method of treating a living animal body for alleviation of a diseased condition due to a thrombosis or a thromboembolism, comprising administering to said body orally, rectally, or parenterally compound selected from the group consisting of

A. thiazolyl benzoic acid compounds of the general formula (I)



(I)

wherein:

R_1 and R_2 are selected from the group consisting of: lower alkyl containing 1 to 5 carbon atoms inclusive, phenylalkyl, phenyl, halophenyl, lower alkylphenyl, lower alkoxyphenyl and for R_1 hydrogen;

A is selected from the group consisting of: hydrogen, halogen, hydroxy, lower alkyl and lower alkoxy; and

B. physiologically acceptable addition salts with mineral or organic bases, in an effective fibrinolytic amount.

4,001,421
THIAZOLE CARDIOVASCULAR AGENTS

John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

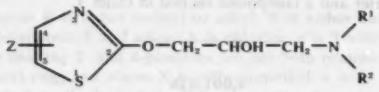
Division of Ser. No. 451,179, March 14, 1974, Pat. No. 3,897,441, which is a continuation-in-part of Ser. No. 289,730, Sept. 15, 1972, Pat. No. 3,850,945, which is a continuation-in-part of Ser. No. 193,172, Oct. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 343,945, March 22, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 562,718

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 **6 Claims**

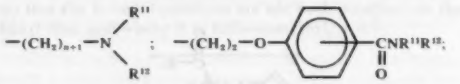
1. A pharmaceutical compostion for treating cardiovascular

disorders in mammals by blocking β-adrenergic receptor sites, comprising a pharmaceutically acceptable carrier and an effective amount of β-adrenergic blocking agent selected from the group of the compounds having the formula:



(I)

wherein R^1 and R^2 are independently selected from the group consisting of hydrogen; lower alkyl; cycloalkyl having from three through seven ring atoms; lower alkenyl; phenyl; phenyl lower alkyl wherein said alkyl has from one through six carbon atoms; substituted phenyl or substituted phenyl lower alkyl wherein said phenyl has one or two substituents independently selected from the group of hydroxy, lower alkyl, lower alkoxy and halo; and groups having the formulas



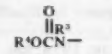
or $-(CH_2)_n-Y'$ wherein n is a whole integer of from one through four; R^{11} and R^{12} are independently hydrogen or lower alkyl; and Y′ is a heterocycle selected from the group of morpholino, pyrrolidinyl, piperidinyl, piperazinyl, N-lower alkylpiperazinyl or N′-hydroxy lower alkylpiperazinyl; or

R^1 and R^2 together with the nitrogen atom to which they are joined form a nitrogen heterocycle selected from the group of morpholino, pyrrolidinyl, piperidinyl, piperazinyl, N′-lower alkylpiperazinyl or N′-hydroxy lower alkylpiperazinyl;

Z is a substituent on the thiazole ring at either the 4 - or 5 -position selected from the group having the formulas:

wherein

R^3 and R^4 are independently selected from the group of hydrogen; alkyl having from one through 12 carbon atoms; cycloalkyl having from three through 12 carbon atoms; phenyl; phenyl lower alkyl wherein said alkyl has from one through six carbon atoms; substituted phenyl or substituted phenyl lower alkyl wherein said phenyl has one or two substituents independently selected from the group of hydroxy, lower alkyl, lower alkoxy, or halo; terminally substituted alkyl group having from two through 12 carbon atoms having one substituted terminal carbon atom having a substituent selected from the group of hydroxy, acyloxy having from two through 12 carbon atoms and alkoxy having from one through six carbon atoms; and groups having the formulas $-(CH_2)_{n-1}NR^8R^9$ or $(CH_2nR^{10}$ wherein n is a whole integer of from one through four, R^8 and R^9 are independently selected from the group of hydrogen and alkyl groups having from one through four carbon atoms and R^{10} is cycloalkyl having from three through eight carbon atoms; and wherein when Z is



then R^4 cannot be hydrogen; a pharmaceutically acceptable salt of the compound of formula I; and mixtures thereof.

4,001,422

4-AMINOQUINAZOLINE CARDIAC STIMULANTS

John C. Danilewicz, Ash; Anthony G. Evans, Sandwich; Allan L. Ham, Broadstairs, and Colin Thomson, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.

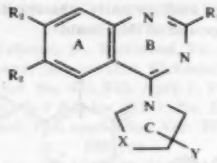
Filed July 24, 1975, Ser. No. 598,723

Claims priority, application United Kingdom, July 25, 1974, 32805/74; Jan. 6, 1975, 416/75

Int. Cl.² A01N 9/22; C07D 239/72

U.S. Cl. 424—251 **24 Claims**

1. A compound selected from the group consisting of



and the pharmaceutically acceptable acid addition salts thereof, wherein

R_1 is selected from the group consisting of hydrogen and alkyl having from one to three carbon atoms;

R_2 is alkoxy having from one to two carbon atoms;

X is selected from the group consisting of —CH=CH—, and alkylene having from one to two carbon atoms; and

Y is a substituent at the 3- or 4-position of ring C selected from the group consisting of $-Z_1COR_3$, $-N(R_4)SO_2R_5$, $-Z_2CONR_6R_7$ and $Z_2CSNR_6R_7$ wherein

Z_1 is selected from the group consisting of $-CH_2-$ and $-N(R_4)-$; R_3 is selected from the group consisting of alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, benzyloxy, phenoxy, ethoxy-carbonylmethyl and pyridyl; R_5 is selected from the group consisting of alkyl having from one to four carbon, pyridyl and $-NR_6R_7$; Z_2 is selected from the group consisting of —O—, $-CH_2-$ and $-N(R_4)-$ wherein R_4 is selected from the group of hydrogen, pyridyl, phenyl, alkyl having from one to four carbon atoms and substituted said alkyl wherein said substituent is selected from the group consisting of amino, dimethylamino, hydroxy, pyridyl and phenyl; and R_6 and R_7 when considered separately are each selected from the group consisting of hydrogen, alkyl having one to four carbon atoms and R_6 and R_7 when considered together with the nitrogen to which they are attached form a piperidine ring, with the proviso that when X is —CH=CH— or $-CH_2CH=CH-$ Y is selected from the group consisting of $-CH_2COR_3$, $-CH_2CONR_6R_7$ and $-CH_2CSNR_6R_7$.

24. A method of stimulating the heart of an animal which comprises administering to said animal a cardiac stimulating amount of a compound selected from the group of claim **1.**

4,001,423

2-(2-ETHOXY)ETHOXYETHYL BENZIMIDAZOLECARBAMATE

Dale I. Dodds, 560 S. Orange Grove Blvd., Pasadena, Calif. 91105

Filed June 20, 1975, Ser. No. 588,933

Int. Cl.² A01N 9/22; C07D 235/12

U.S. Cl. 424—273 **5 Claims**

1. 2-(2-ethoxy)ethoxyethyl benzimidazolecarbamate.

2. A fungitoxic composition comprising from about 0.1 to about 2.5 percent by weight of 2-(2-ethoxy) ethoxyethyl benzimidazolecarbamate and a carrier therefor to make up 100 percent by weight of the composition.

4,001,424
1-OXO-1H-NAPHTHO[2,1-b]PYRAN DERIVATIVES FOR TREATING DEPRESSION

Norina Passerini, Milan; Aldo Ermili, Genoa; Giorgio Roma, Genoa; Alessandro Balbi, Genoa, and Mauro Mazzei, Genoa, all of Italy, assignors to Carlo Erba S.p.A., Italy

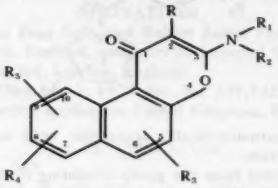
Division of Ser. No. 493,611, July 31, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,329

Claims priority, application Italy, Sept. 27, 1973, 29430/73; Sept. 28, 1973, 29485/73

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 **7 Claims**

1. Method of treating depression in patients in need of such treatment, said method comprising orally administering to said patients an antidepressive therapeutically effective amount of a compound of the formula:



wherein R may be hydrogen, halogen or C_1–C_6 alkyl; each of the R_3, R_4 and R_5 groups, being the same or different, may be hydrogen, halogen, nitro, hydroxy, amino, C_1–C_6 alkyl, C_1–C_6 alkoxy or trifluoromethyl; each of the R_1 and R_2 groups, being the same or different, may be hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, or R_1 and R_2, taken together with the nitrogen atom, may form a monocyclic ring which may contain one or more other hetero atoms, or a physiologically acceptable salt thereof.

4,001,425
METHODS OF TREATING HYPERTENSION AND PHARMACEUTICAL COMPOSITIONS COMPRISING 1-TERTIARY-ALKYL-3-(SUBSTITUTED FURYL)UREAS AS ANTIHYPERTENSIVE AGENTS

William A. Price, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

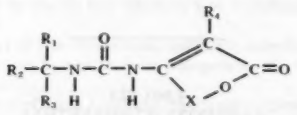
Continuation-in-part of Ser. No. 461,698, April 17, 1974, abandoned. This application Mar. 11, 1975, Ser. No. 555,309

Int. Cl.[2] A61K *31/34*

U.S. Cl. 424—285 **20 Claims**

1. A method of treating hypertension in a warm-blooded animal comprising administering to said warm-blooded animal an antihypertensive amount of a compound selected from the group consisting of

a. compounds of the formula



where

R_1, R_2, and R_3 are C_1–C_4 alkyl, C_2–C_4 alkenyl, or C_2–C_4 alkynyl, with the provisos that the total number of carbon atoms of R_1 plus R_2 plus R_3 does not exceed 6, that not more than one of R_1, R_2, or R_3 is alkynyl, and that two of R_1, R_2, and R_3 may be joined to form a cycloalkyl or cycloalkenyl group;

X is $-CH_2-$, methyl-substituted methylene, ethyl-substituted methylene, propyl-substituted methylene, or butyl-substituted methylene; and

R_4 is hydrogen or methyl with the proviso that when R_4 is methyl, X is methylene; and

b. sodium, potassium, or calcium salts of the compounds of (a) wherein X is methylene, methyl-substituted methylene, or ethyl-substituted methylene.

9. A pharmaceutical composition comprising a pharmaceutical carrier and a compound recited in claim 1.

4,001,426
SUBSTITUTED BENZOFURANS AND BENZOTHIOPHENES

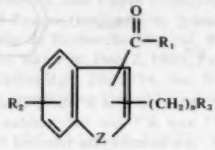
L. Martin Brenner, Havertown, and Charles K. Brush, Malvern, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 515,808, Oct. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 462,008, April 18, 1974, abandoned. This application May 9, 1975, Ser. No. 575,877

Int. Cl.[2] C07D *405/12*

U.S. Cl. 424—285 **23 Claims**

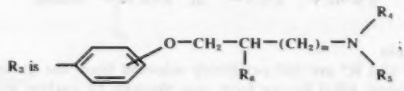
1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which:

R_1 is phenyl, halophenyl, dihalophenyl, trihalophenyl, lower alkylphenyl, di-lower alkylphenyl, tri-lower alkylphenyl, lower alkoxyphenyl, di-lower alkoxyphenyl, tri-lower alkoxyphenyl, lower alkyl-di-lower alkoxyphenyl or lower alkoxy-di-lower alkylphenyl;

R_2 is hydrogen, halo, lower alkyl, lower alkoxy, nitro or trifluoromethyl;

R_3 is  ;

R_4 is hydrogen, methyl, ethyl or propyl and R_5 is methyl, ethyl or propyl or R_4 and R_5 together with the nitrogen atom to which they are attached form a pyrrolidine, piperidine, N-(lower alkyl)piperazine, morpholine or perhydroazepine ring;

R_6 is hydrogen or hydroxy;

m is 0 or 1 when R_6 is hydrogen and 1 when R_6 is hydroxy;

n is 0 or 1; and

Z is oxygen or sulfur.

4,001,427
N-DIMETHYLACETONITRILE-α-(SUBSTITUTED PHENOXY) ALKYLAMIDES AND THEIR USE AS MITICIDES

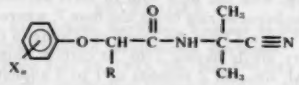
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,727

Int. Cl.[2] A01N *9/20, 9/24*; **C07C** *121/78*

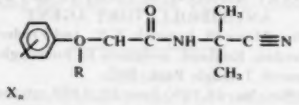
U.S. Cl. 424—304 **26 Claims**

1. A compound having the formula



wherein R is either methyl or ethyl; X is either chlorine or trifluoromethyl; and where X is chlorine, *n* is 3 with the proviso that the 2- and 4-positions are not both occupied on the phenyl ring; and where X is trifluoromethyl, *n* is 1.

14. A method of controlling mites comprising applying to said mites a miticidally effective amount of a compound having the formula



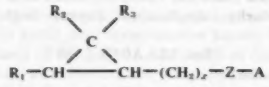
wherein R is either methyl or ethyl; X is either chlorine or trifluoromethyl; and where X is chlorine, *n* is 3 with the proviso that the 2- and 4-positions are not both occupied on the phenyl ring; and where X is trifluoromethyl, *n* is 1.

4,001,428
CYCLOPROPANE DERIVATIVES AND USE THEREOF AS CELL MEMBRANE MOBILITY AGENTS

Edward M. Kosower, and Nechama S. Kosower, both of Tel-Aviv, Israel, assignors to Polymer Sciences Corporation, New York, N.Y.

Filed July 22, 1975, Ser. No. 598,133
Claims priority, application Israel, July 22, 1974, 45320
Int. Cl.² A61K *31/25*; **C12K** *9/00*; **C07C** *69/00*
U.S. Cl. 424—307 **16 Claims**

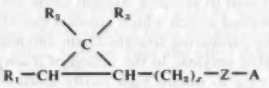
1. Compounds capable of functioning as membrane mobility agents in plant and animal cells and having a structure represented by the formula



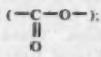
in which A represents a polyalkoxyalkyl hydrophilic chain; Z represents an ester linkage

R_1 represents a straight-chain alkyl group or a straight-chain alkyl group interrupted by one or more cyclopropyl groups; R_2 and R_3 each represent either hydrogen, lower alkyl, or a halogen group; and *x* represents an integer from 2 to 10.

7. A method for altering the mobility of membrane components in animal and plant cells to biologically alter such cells in their response to external stimuli which comprises treating such cells with an effective amount of at least one compound having a structure represented by the formula



in which A represents a polyalkoxyalkyl hydrophilic chain; Z represents an ester linkage



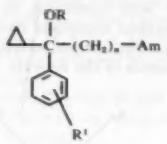
R_1 represents either a straight-chain alkyl group or a straight-chain alkyl group interrupted by one or more cyclopropyl groups; R_2 and R_3 each represent either hydrogen, lower alkyl, or a halogen group; and *x* represents an integer from 2 to 10.

4,001,429
1-CYCLOPROPYL-1-PHENYL-ω-AMINO-1-ALKANOLS AND 1-LOWER-ALKYLACYL DERIVATIVES AS ANALGETICS

William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 456,940, April 1, 1974, Pat. No. 3,928,426, which is a division of Ser. No. 221,804, Jan. 28, 1972, abandoned. This application Apr. 28, 1975, Ser. No. 580,106
Int. Cl.² A61K *31/22*, *31/445*
U.S. Cl. 424—311 **3 Claims**

1. A process which comprises administering to a living animal body for its analgesic effect a compound selected from those having the formula



wherein:

Am is lower-alkylamino and di-lower-alkylamino,

R is lower alkanoyl,

R^1 is selected from halogen, hydrogen, lower-alkoxy, lower-alkyl, and trifluoromethyl,

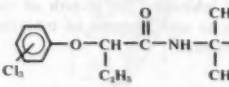
n is selected from two and three, and the pharmaceutically acceptable acid addition salts thereof.

4,001,430
N-T-BUTYL-α-TRICHLOROPHENOXYBUTYRAMIDES AND THEIR USE AS MITRICIDES

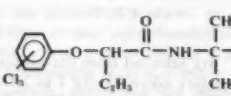
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,728
Int. Cl.² A01N *9/20*, *9/24*; **C07C** *103/75*
U.S. Cl. 424—324 **8 Claims**

1. A compound having the formula



5. A method of controlling mites comprising applying to said mites a miticidally effective amount of a compound having the formula



4,001,431
DERIVATIVES OF THE 1,2-DIARYLETHYLENE- AND PHARMACEUTICAL COMPOSITIONS THEREOF

Hermann Teufel, Kelkheim, Taunus; Wilhelm Bartmann, Neuenhain, Taunus; Ernold Granzer, Kelkheim, Taunus, and Josef Musil, Konigstein, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

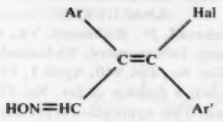
Filed Mar. 7, 1975, Ser. No. 556,221

Claims priority, application Germany, Mar. 9, 1974, 2411325; Feb. 22, 1975, 2507685

Int. Cl.² A61K *31/15*; **C07C** *131/00*

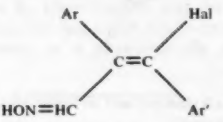
U.S. Cl. 424—327 **3 Claims**

1. A 1,2-diaryl-ethylene of the formula



wherein Hal is chlorine or bromine and Ar and Ar′ are each phenyl substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy, and halogen, or one of Ar and Ar′ is phenyl and the other is substituted phenyl.

3. A method for treating disorders of purine metabolism, hyperlipidemiae, or both conditions, in a patient suffering therefrom, which method comprises administering an effective amount of at least one compound selected from the group consisting of compounds of the formula



wherein Hal is chlorine or bromine and Ar and Ar′, which are the same or different, are phenyl or phenyl substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy, and halogen.

4,001,432
METHOD OF INHIBITING THE GROWTH OF BACTERIA BY THE APPLICATION THERETO OF CAPPED POLYMERS

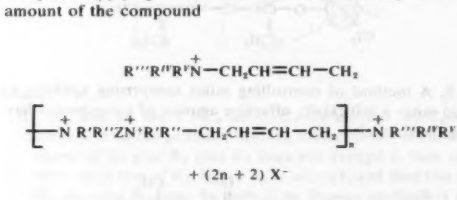
Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Apr. 17, 1975, Ser. No. 568,899

Int. Cl.² A01N *9/20*, *9/24*, *9/00*, *9/22*

U.S. Cl. 424—329 **1 Claim**

1. A method of inhibiting the growth of bacteria which comprises applying to said bacteria an inhibitorily effective amount of the compound



wherein R′ and R″ are selected from the group consisting of (a) primary or secondary alkyls having 1 to 20 carbon atoms, (b) hydroxy or dihydroxy derivatives of R′ and R″, (c) benzyl, and (d) benzyl having at least one alkyl group bonded to the benzene ring, with the total sum of alkyl carbon atoms attached to the benzene ring being less than 7; wherein R‴, R^{IV} and R^{V} are selected from the group consisting of (a) primary or secondary alkyls having 1 to 20 carbon atoms and (b) hydroxyalkyl; wherein Z consists of 1 to 3 aliphatic divalent radicals, each of which has 2 to 10 carbon atoms with each aliphatic radical having 0 to 2 double bonds and 0 to 2 hydroxy substituents; wherein X is selected from the group consisting of chlorine and bromine; and wherein *n* is an integer of about 2 to about 30.

4,001,433
QUATERNARY AMMONIUM COMPOUNDS USEFUL AS ANTIFIBRILLATORY AGENT

Robert Arthur Maxwell, Armonk, N.Y., and Frederick Charles Copp, London, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 48,489, June 22, 1970, abandoned. This application Apr. 1, 1974, Ser. No. 457,229

Claims priority, application United Kingdom, July 23, 1969, 31686/69; Dec. 4, 1969, 59230/69

Int. Cl.² A61K *31/14*

U.S. Cl. 424—329 **27 Claims**

1. A method for the treatment or suppression of cardiac arrhythmias in a mammal which has had cardiac arrhythmias and which is in need of said treatment or suppression comprising the administration to said mammal of a non-toxic, effective anti-arrhythmic treatment or suppression amount of a pharmaceutically acceptable non-toxic salt of the N-m-methoxybenzyl-N,N-dimethyl-N-ethyl-ammonium cation.

4,001,434
METHOD OF SLOWING SUBLIMATION OF SUBLIMABLE MATERIAL

Yoshinobu Nakai, 2-5-2 Komagome, Toshima, Tokyo; Shin'Ichiro Nakajima, 1-511-5 Tsudanuma, Narashino, Chiba, and Yoshimitsu Iida, 1-25-7 Oui, Kija, Tokyo, all of Japan

Filed Mar. 12, 1975, Ser. No. 557,870

Claims priority, application Japan, Sept. 13, 1974, 49-104900

Int. Cl.² A01N *5/00*

U.S. Cl. 424—361 **3 Claims**

1. The method of slowing sublimation of a sublimable pharmaceutical material consisting essentially of mixing the sublimable material with beta-1, 4-glucan, and pulverizing the mixture.

4,001,435
PROCESS FOR PREPARING FOODS AND DRINKS

Mamoru Hirao, and Yoshinori Sato, both of Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

Filed July 7, 1969, Ser. No. 839,689

Claims priority, application Japan, July 8, 1968, 43-47650

Int. Cl.² A23G *3/30*

U.S. Cl. 426—3 **13 Claims**

1. A process for preparing foods and drinks sweetened mildly, and protected against discoloration, Strecker's reaction, and moisture absorption, which comprises: adding α-1,6-glucosidase and β-amylase, under such conditions and in a quantity sufficient to produce straight chain amylose, to enzymatically liquefied starch which consists essentially of amylopectin thereby producing straight-chain amylose; and subjecting the resulting amylose to the action of β-amylase and purifying and drying to obtain high purity maltose in crystalline powder form of 90– 95% maltose; and then adding said high purity crystalline maltose powder to foods and drinks as the essential added sweetener.

4,001,436

BEVERAGES

John Clark, St. Michael, Barbados, assignor to Banks Barbados Breweries Limited, Bridgetown, Barbados

Filed July 25, 1975, Ser. No. 599,033

Claims priority, application United Kingdom, Aug. 3, 1974, 34293/74

Int. Cl.² A23L *2/00*; C02D *1/00*

U.S. Cl. 426—29 15 Claims

1. A method of producing a soft drink product comprising the steps of (a) procuring a sugar solution containing glucose and fructose, (b) mashing malted grain in water, (c) allowing malt action in the mash to convert starch into maltose with protein breakdown into amino acids, (d) converting the maltose into glucose to provide a converted aqueous malt extract, and (e) mixing the sugar solution with the converted malt extract.

4,001,437

PROCESS FOR MAKING AND FLAVORANTS FROM MILK PRODUCTS AND COMPOSITIONS CONTAINING SAME

Kurt Jaeggi, Dubendorf; Victor Krasnobajew, Zollikerberg; Peter Weber, Greifensee, and Jost Wild, Uster, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Dec. 5, 1973, Ser. No. 422,034

Claims priority, application Switzerland, Dec. 18, 1972, 18494/72; Oct. 16, 1973, 14660/73

Int. Cl.² A23L *1/23*, *1/231*

U.S. Cl. 426—34 17 Claims

1. A process for the manufacture of substances having the flavor character of baked goods or meat, which process comprises heating to temperatures between 90° C. and 180° C. for 15 minutes to 2 hours a liquid product obtained from a member selected from the group consisting of full cream milk, skim milk, whey, yoghurt and buttermilk, by enzymatic proteolysis and lactic acid fermentation, said enzymatic proteolysis having been carried out for a time sufficient to clarify an aqueous suspension of said liquid product, using proteolytically active enzymes (proteases) of vegetable, animal or microbial origin which are capable of clarifying aqueous suspensions of said milk products in less than 24 hours in weakly acid, neutral or weakly basic aqueous media at temperatures between 30° and 60° C, and said lactic acid fermentation having been carried out using bacteria of the genus Lactobacilli or Streptococci in aqueous medium in a temperature range between 30° and 45° C up to a final pH of ca. 4,5 of the aqueous medium, with the proviso that yoghurt is subjected only to enzymatic proteolysis.

4,001,438

FLAVOR COMPOSITION FOR USE IN ORALLY UTILIZABLE COMPOSITIONS

Don Marmo, Farmingdale, and Frank Louis Rocco, Richmond Hill, both of N.Y., assignors to International Flavors & Fragrances Inc, New York, N.Y.

Continuation-in-part of Ser. No. 514,947, Oct. 15, 1974, Pat. No. 3,920,849. This application Aug. 12, 1975, Ser. No. 603,933

Int. Cl.² A23L *1/222*

U.S. Cl. 426—96 3 Claims

2. The method of preparing a flavoring comprising:

1. Admixing

a. From about 3 up to about 7 parts by weight of a non-confined hydrophobic flavor oil; and

b. From about 0.1 up to about 1 part by weight of a solid suspending agent selected from the group consisting of colloidal silica, xanthan gum and ethyl cellulose having a particle size of from about 0.008 up to about 0.030 microns, a surface area of from about 150 up to about 400 m^2/cm and a density of from about 2.0 up to about 3.0 lbs/cu. ft.,

thereby forming a first suspension; and

2. Admixing said first suspension with from about 3 up to about 7 parts by weight of a hydrolytically releaseable flavor oil physically entrapped in an edible solid material selected from the group consisting of gum acacia, gelatin, modified food starch and dextrin, said solid material having a particle size of from about 5 microns up to about 400 microns

thereby forming a second suspension, said physically entrapped flavor oil being organoleptically compatible with said non-confined hydrophobic flavor oil.

4,001,439

METHOD OF PRODUCING ICE CREAM IN INDIVIDUAL SLICED FORM

Nick Zonni, 6311 Southwind Drive, and Marco Zonni, 10420 Lundene Drive, both of Whittier, Calif. 90601

Filed May 3, 1976, Ser. No. 682,715

Int. Cl.² A23G *9/04*

U.S. Cl. 426—101 8 Claims

1. A method of producing ice cream in individual sliced form, comprising the steps of:

providing a pair of matching molds, said molds having an elongated compartment formed therein to receive the ice cream, one of said molds being the top mold and the other said mold being the bottom mold;

depositing at least one layer of soft ice cream in said compartment of each mold to a point below the open edge of each mold, wherein a space is arranged between the layer of ice cream and the open edge thereof;

positioning a plurality of a fruit product in one of said molds, said fruit being arranged longitudinally therein in a contiguous manner;

freezing said ice cream disposed in said molds;

adding another soft layer of ice cream within said space in said molds after freezing;

joining said molds together allowing the soft layers of ice cream to co-mingle;

freezing said ice cream to form a single elongated ice cream bar; and

slicing said ice cream bar into a multiplicity of slices having a predetermined thickness.

4,001,440

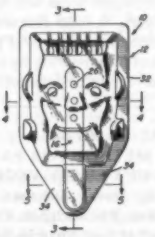
FREEZABLE CONFECTION PACKAGE

Earl Hoyt, Ramsey, N.J., assignor to Welch Foods Inc., Westfield, N.Y.

Filed July 24, 1974, Ser. No. 491,528

Int. Cl.² A23G *1/00*

U.S. Cl. 426—104 11 Claims



1. A freezable confection package comprising a wrapper, said wrapper including a planar back sheet and a front sheet formed to define a confection accommodating and molding chamber with the planar back sheet, an elongated handle substantially narrower than said chamber projecting outward from the interior of, at a point central to one edge of, said chamber and terminating in a free outer end, said handle, within the chamber, paralleling the planar back sheet in spaced relation thereto centrally within the chamber, and

outward of the chamber, being offset relative to the portion in the chamber and being received between said front and back sheet in overlying contact with said back sheet, said sheets being sealed to each other about the chamber and outward projecting portion of the handle to define a closed chamber, said sheets forming a rigidifying web on each side of said handle diverging from the outer end of the handle to the full width of said chamber edge to form generally triangular rigidifying gussets, said sheets additionally forming an outwardly projecting planar second rigidifying web about the remaining edges of said chamber integral with said rigidifying gussets, and a room temperature, liquid confection enclosed within said chamber, said liquid being freezable to solid state in a home freezer, said formed front sheet being configured to define a design simulation over the chamber which is reproduced on said confection enclosed therein.

4,001,441

MEAT ANALOG

Alexander L. Liepa, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1970, Ser. No. 100,549

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—104 **38 Claims**

1. A process of making meat analogs which comprises forming a dry protein mix wherein the protein is a water hydratable heat-coagulable protein, adjusting the moisture content of the dry mix to form a dough-like protein wet mix, sheeting the protein wet mix to form a coherent workable protein dough sheet, cutting the sheet to form fiber-like strands, aggregating the strands into a desired fiber alignment, and stabilizing the fibers to form a coherent fiber mass resembling meat in appearance, texture, and eating quality.

4,001,442

COLLAGEN-CONTAINING PREPARATIONS

Bruno Stahlberger, Buchs, Switzerland, and Werner von Dach, Balzers, Liechtenstein, assignors to Elastin-Werk Aktiengesellschaft, Triesen, Liechtenstein

Filed July 17, 1974, Ser. No. 489,097

Claims priority, application Germany, July 18, 1973, 2336561

Int. Cl.[2] A22C *13/00*; **C08L** *89/06*

U.S. Cl. 426—105 **45 Claims**

1. A preparation which comprises collagen and a precondensate, which precondensate comprises

a. one or more structural units derivable from a compound containing at least one amino group, and

b. one or more structural units derivable from a compound containing at least one aldehyde group, or one or more structural units derivable from a polyhydroxy compound which precondensate is also reacted with a compound containing an aldehyde group, said preparation containing at least 39% but at most 90% by weight of precondensate, based on the weight of collagen plus precondensate.

4,001,443

PACKAGE AND METHOD FOR PACKAGING AND STORING CUT LEAFY VEGETABLES

Bhalchandra Anantray Davé, Glendora, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 656,921, Feb. 10, 1976, abandoned. This application Feb. 24, 1976, Ser. No. 660,895

Int. Cl.[2] A23L *3/34*; **A23B** *7/14*; **B65B** *25/04*

U.S. Cl. 426—106 **10 Claims**

1. A method of increasing the storage life of cut leafy vegetables comprising (1) contacting said cut vegetables for from about 5 to about 20 seconds with an aqueous solution having from about 70 to about 150 volume parts per million of chlorine, a buffered pH of from about 5 to about 7 and a temperature ranging from about 45° to 60° F., (2) removing the adhered moisture of said aqueous solution from said cut vegetables, (3) without further chemical treatment and prior to storage placing said cut vegetables into a sealable package of a flexible sheet material having a water vapor transmission rate of from about 0.02 to about 3 grams per 100 square inches per 24 hours per mil at 100° F and 90 percent relative humidity, a nitrogen gas permeability of about 0.1 to about 3.0, an oxygen gas permeability of about 0.3 to about 10 and a carbon dioxide permeability of from about 0.3 to about 35, said gas permeabilities being measured in cubic centimeters per 100 square inches per 24 hours per mil at standard temperature and pressure, (4) partially evacuating air from said package in an amount sufficient to collapse the package wall about the vegetables but without damaging said vegetables, (5) sealing said package, and (6) storing said package at a temperature from about 35° to about 45° F. and a relative humidity of about 85 to about 100 percent.

4,001,444

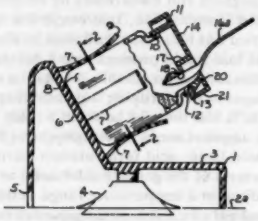
BABY FOOD FEEDER

William A. Clarke, 1001 Linden Ave., Erie, Pa. 16505

Filed Jan. 10, 1975, Ser. No. 539,999

Int. Cl.[2] B65D *85/72*, *47/40*

U.S. Cl. 426—110 **6 Claims**



1. In combination with a jar of baby food having a rim at its top and removable closure on said rim, a cover substituted for said closure, said cover having:

means for mounting it on said jar rim, a front face transverse to the axis of the jar and spaced axially outward from said jar rim and having a mouth spaced axially outward from said jar rim, said mouth having a generally straight lip and another lip concave with respect to said straight lip, said mouth providing a spoon access opening with a loose fit for the bowl of a spoon through which the bowl of a spoon may be dipped into the contents of the jar with the convex side of the bowl of the spoon presented to said concave lip and with the concave side of the bowl of the spoon presented to said straight lip, a spoon leveling means recessed axially inward from said straight lip and spaced axially inward from said mouth for scraping excess food from the concave side of the bowl of the spoon as it is withdrawn through said mouth, and a concave wall extending axially inward from said concave lip to said jar rim for catching and draining into said jar food scraped from said spoon, said lips cooperating to scrape excess food from the concave and convex sides of said spoon when the bowl of said spoon is inserted through said mouth, dipped into the food in the jar to pick up food in the bowl and then withdrawn through said opening.

4,001,445

PRESERVED MEAT

Derek Horrocks, Knossington; Keith Buckley, and Alan John Vernon, both of Melton Mowbray, all of England, assignors to Pedigree Petfoods Limited, Melton Mowbray, England

Filed May 7, 1973, Ser. No. 357,598

Claims priority, application United Kingdom, May 11, 1972, 22196/72

Int. Cl.² A23B *4/14;* A23L *3/34*

U.S. Cl. 426—250 5 Claims

1. A method of preserving undenatured proteinaceous material selected from the group consisting of raw animal tissue, raw meats, fish, meat offals and meat-like protein products, which method consists essentially in:

providing said material in an undenatured naturally moist condition;

treating said material when containing active enzymes to inhibit enzyme activity without cooking;

infusing into said material at a temperature within the range of −25° to +40° C sufficient edible water-soluble solute to impart a water activity in the range of 0.75 to 0.85 and stabilize the material against microbiological spoilage; and

packing said material with said sufficient solute and in an undenatured condition substantially in the absence of oxygen thereby maintaining the natural raw meat appearance and texture of said material.

4,001,446

COLOR STABILIZED PRODUCT AND PROCESS

Larry Lee Hood, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 28, 1975, Ser. No. 626,285

Int. Cl.² A23L *1/27;* A22C *11/00;* A23K *1/04, 1/10*

U.S. Cl. 426—250 21 Claims

1. A process for forming a stabilized red color in an animal protein source containing iron comprising:

A. obtaining at least one animal protein source selected from the group consisting of meat, blood, and a meat by-product;

B. forming a slurry, dispersion, or suspension of the protein source;

C. adding at least one edible reducing agent to the protein source wherein the reducing agent comprises up to 2% by weight of the protein source, and whereby the iron content of the protein source is maintained in the ferrous state;

D. agitating the slurry dispersion, or suspension of the protein source;

E. reacting the protein source with carbon monoxide sufficiently to achieve at least 10% saturation to form a retort- and color-stabilized protein source; and

F. recovering the retort- and color-stabilized protein source.

4,001,447

2-HYDROXYMETHYL-THIAZOLE-5-CARBOXYLIC ACID DERIVATIVES

André Poittevin, Vaires-sur-Marne, and Michel Hardy, Maisons-Alfort, both of France, assignors to Roussel-UCLAF, Paris, France

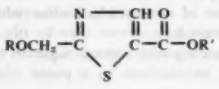
Filed Oct. 15, 1975, Ser. No. 622,635

Claims priority, application France, Oct. 29, 1974, 74.36080

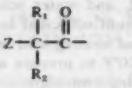
Int. Cl.² C07D *277/34*

U.S. Cl. 424—270 20 Claims

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, alkylcarbonyl of 2 to 5 carbon atoms, benzoyl, phenyl optionally substituted with at least one halogen and



R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, Z is selected from the group consisting of phenyl and phenoxy optionally substituted with at least one halogen and R′ is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and alkali metals, alkaline earth metals and aluminum salts.

15. A hypolipemiant composition comprising an hypolipemiantly effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

16. A method of reducing the amount of sanguine lipids in warm-blooded animals which comprises administering to warm-blooded animals an hypolipemiantly effective amount of at least one compound of claim 1.

4,001,448

BEVERAGE MIX AND METHOD OF MANUFACTURING SAME

Thomas P. Finucane, Hartsdale, N.Y.; Theodore J. Kovacic, Downers Grove, and John R. Wisler, Westmont, both of Ill., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 360,212, May 14, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,702

Int. Cl.² A23L *2/00*

U.S. Cl. 426—285 7 Claims

1. The method of manufacturing a free flowing dry beverage mix containing a flavor, a color, and from about 1 to 6 grams of a food acid for each quantity of mix for preparing one quart of beverage, the food acid selected from the class consisting of citric, malic and mixtures thereof, which method comprises: incorporating as an ingredient of the dry beverage mix from about 1 to 3 grams of a mixture of mono-and dicalcium phosphates for each quantity of mix for preparing one quart of beverage, wherein the dicalcium phosphate is present at a level between 4% and 10% by weight of the mixture of phosphates.

4,001,449

INTERMEDIATE MOISTURE ANIMAL FOOD HAVING IDENTIFIABLE MEAT AND EGG COMPONENTS

Eugene H. Reardanz, and Jerry N. Boudreau, both of Kankakee, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,789

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A23K *1/14;* A23L *1/32*

U.S. Cl. 426—332 9 Claims

1. A process for preparing a shelf-stable, intermediate-moisture meat and egg animal food adapted to be packaged without resort to sterilization or refrigeration, said animal food having a moisture content of from 15 percent to 30 percent and having a substantially neutral pH of from about 6.0 to 8.0, comprising:

a. forming a mixture of proteinaceous meaty materials and water soluble solutes, principally sugar in an amount sufficient to impart bacteriostasis to said mixture, and heating said mix at a temperature above about 150°F to prepare a first shelf-stable meat component having a moisture content of 15 percent to 30 percent, a pH of from about 6.0 to 8.0, and sugar from 15 percent to 35 percent by weight;

b. extruding the meat component prepared in(a) to desired shape;

c. forming a mixture of 5 percent – 45 percent egg on a dry basis, 10 to 40 percent added water, 5 percent – 50 percent vegetable protein, an effective level of an edible binder material, and water soluble solutes, principally sugar in an amount sufficient to impart bacteriostasis to said mixture and heating said mixture at a temperature above about 150°F to prepare a second shelf-stable egg component having a moisture content of 15 percent to 30 percent, a pH of from about 6.0 to 8.0, and sugar from 15 percent to 35 percent by weight;

d. extruding the egg component prepared in(c) to desired shape;

e. blending said meat component and said egg component in desired ratios in a manner which avoids a substantial loss of identity of each component; and

f. pressing said mixture of(e) whereby the meat and egg components are bound together into a desired shape.

4,001,450

METHOD OF PACKAGING CARBONATED BEVERAGES IN FLEXIBLE CONTAINERS

Andrew George Ford, Hitchin, and Ronald Augustus Hudson, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

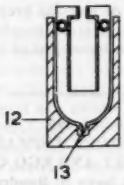
Continuation-in-part of Ser. No. 749,500, Aug. 1, 1968, abandoned. This application Apr. 24, 1972, Ser. No. 246,992

Claims priority, application United Kingdom, Aug. 1, 1967, 35334/67

The portion of the term of this patent subsequent to July 10, 1990, has been disclaimed.

Int. Cl.[2] B65B *31/02*

U.S. Cl. 426—410 **5 Claims**



3. A method of packaging a carbonated beverage that comprises providing an individual, flexible, tubular plastics-film container closed in a gas-tight manner except at a filling opening, inflating the container by means of carbon dioxide supplied through said filling opening to a pressure such that the container attains substantially the size desired in the final package, filling the container by displacing a major part but less than the whole of the carbon dioxide therein with the carbonated beverage to be packed supplied through said opening, and sealing the filling opening of the container, both the filling and the sealing being carried out while at least the major part of the container is kept substantially at its final size, and relaxation of the walls thereof is prevented, by continuously maintaining a greater pressure inside the container than outside the walls thereof until sealing has been completed, the prevention of relaxation of said walls during filling and sealing enabling a full charge of beverage to be supplied to the container while leaving a gas space adjacent said filling opening whereby the seal can be made between dry plastics surfaces.

4,001,451

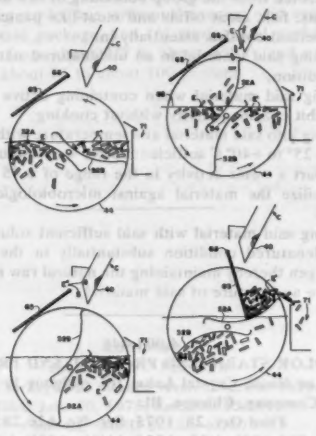
PROCESS FOR DEEP FAT FRYING COMESTIBLES IN AN AUTOMATIC DEEP FAT FRYER

John L. Veeneman; Marion E. Thomas, and Harry R. Deveraux, all of Idaho Falls, Idaho, assignors to American Potato Company, San Francisco, Calif.

Continuation of Ser. No. 379,298, July 16, 1973, abandoned, which is a division of Ser. No. 251,611, May 8, 1972, Pat. No. 3,776,126. This application May 7, 1975, Ser. No. 575,325

Int. Cl.[2] A23L *1/10*

U.S. Cl. 426—438 **6 Claims**



1. A process for deep fat frying comestible bodies comprising the steps of:

a. forming said bodies of desired size;

b. providing within an imperforate container a drum-shaped basket having a perforate cylindric wall extending more than 180° and having an open top, said basket having first and second opposed overlapping arcuate segments mounted for rotation about a center axis corresponding to about the center axis of said basket, said segments each having a corresponding radius of curvature;

c. supplying cooking oil heated to about 350° F to said container in an amount sufficient to cover comestible bodies when held submerged by said arcuate segments when in a horizontal position;

d. introducing a first lot of said formed comestible bodies into said cooking oil while said first arcuate segment is in substantially vertical position;

e. rotatably advancing said first segment through one and one quarter revolutions to provide tumbling agitation of said comestible bodies and advance said comestible bodies to a position where the first arcuate segment holds said comestible bodies submerged in said oil to partially cook them;

f. interrupting said rotatable advancement for a time sufficient to complete the cooking of said comestible bodies within said oil;

g. further advancing said first segment about 30° until the second arcuate segment is above the oil surface so as to allow a previous lot of comestibles thereon to be drained of excess oil;

h. discharging said previous lot of drained comestible bodies by sweeping them peripherally from the upper surface of said second segment;

i. further advancing said second segment to a substantially vertical position to allow the introduction of a second uncooked lot of comestible bodies while said first lot continues to cook;

j. further advancing said second segment through one and one quarter revolutions to a point where said second

segment is in a horizontal position allowing said first and second lots to further cook;

k. further advancing said second segment about 30° to a point where said first lot of completely cooked comestible bodies on said first segment is above the oil surface and allowed to drain;

l. discharging said first lot of cooked comestible bodies from said first segment by sweeping them peripherally from the upper surface thereof;

m. advancing said first segment about 60° to the position described in step d); and

n. repeating process steps d) through i) to produce subsequent lots of cooked comestible bodies.

4,001,452

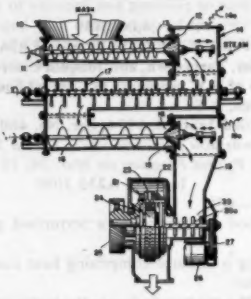
METHOD OF PREPARING ANIMAL FOOD PELLETS

Merl A. Williams, Craigville, Ind., assignor to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Sept. 10, 1975, Ser. No. 612,242

Int. Cl.² A23L *1/01;* **A23K** *1/00;* **B29C** *23/00*

U.S. Cl. 426—454 **2 Claims**



1. In a method of preparing animal food pellets wherein cooked mash under atmospheric pressure is forced through a die, the steps of cooking said mash under superatmospheric pressure, reducing the pressure on said mash to atmospheric, radially forcing said mash through orifices of a rotating die to form deaerated rods of substantialy uniform consistency across successive transverse planes and characterized by the substantial absence of fractures on the lagging side of the rod and thereafter transversely severing the rods to form pellets.

4,001,453

SWEETENING COMPOSITIONS

Ulrich Huber, Zurich; Nicolas Kosslakoff, Dubendorf, and Bruno Vaterlaus, Feldmeilen, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Sept. 19, 1974, Ser. No. 507,659

Claims priority, application Switzerland, Oct. 5, 1973, 14249/73; Aug. 14, 1974, 11131/74

Int. Cl.² A23L *1/22*

U.S. Cl. 426—533 **8 Claims**

1. A sweetening composition which comprises a dihydrochalcone sweetening agent selected from the group consisting of neohesperidin dihydrochalcone, naringin dihydrochalcone and hesperetin dihydrochalcone glucoside, and at least two parts by weight of an additive which is a member of the group consisting of glucono-delta-lactone and gluconic acid, or a physiologically acceptable salt of either of said members, per each part by weight of said sweetening agent, whereby the sweetening effect of said agent becomes apparent substantially instantly.

4,001,454

FLAVORING FOODS WITH 8-METHYL-NON-2YNOL AND ITS DERIVATIVES

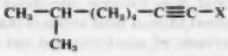
Henri Jindra, Geneva, Switzerland, and William Patrick Clinton, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 28, 1975, Ser. No. 581,451

Int. Cl.² A23L *1/226*

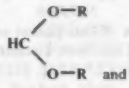
U.S. Cl. 426—534 **13 Claims**

1. A process fpr enhancing the woody flavor of foodstuffs comprising adding thereto a compound selected from the formula:



Where X is selected from the group consisting of CH_2OH,

and



where R′ is hydrogen, lower alkyl or substituted lower alkyl and R is alkyl or substituted lower alkyl in a small but effective amount to give a woody flavor.

4,001,455

SWEETENING COMPOSITIONS

Anthony Laurence La Via, East Brunswick, and John Anthony Hill, New Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 22,687, March 25, 1970, abandoned. This application Feb. 5, 1974, Ser. No. 439,778

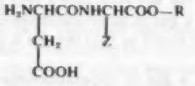
The portion of the term of this patent subsequent to Oct. 3, 1989, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

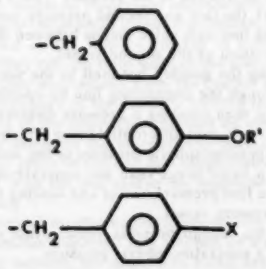
Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **2 Claims**

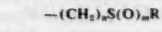
1. A method of masking the aftertaste of saccharin, which comprises adding to the saccharin a dipeptide ester of the formula



wherein Z is:



or



wherein R is an alkyl radical of up to 6 carbon atoms, or an alkyl-aryl or alicyclic radical of up to 10 carbon atoms, R′ is hydrogen or an alkyl radical of up to 6 carbon atoms, *m* is 0 or 2, *n* is 1 or 2, and X is halogen, the dipeptide ester being present in an amount from at least about that amount effective to mask the aftertaste of saccharin and not above about its threshold level of taste.

4,001,456

LOW CALORIE SWEETENING COMPOSITION AND METHOD FOR MAKING SAME

Martin Glicksman, Valley Cottage, N.Y., and Bartley N. Wankier, Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 55,561, July 16, 1970, Pat. No. 3,761,288. This application Aug. 13, 1973, Ser. No. 387,848

The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **8 Claims**

1. A method for producing a rapidly soluble sweetening composition comprising the steps of forming an aqueous solution of an edible bulking agent and L-aspartyl-L-phenylalanine methyl ester, said bulking agent being selected from the group consisting of organic acids, hydrolyzed starch materials and sugars, said aqueous solution containing less than one part L-aspartyl-L-phenylalanine methyl ester per part of bulking agent, and spray drying the solution at a feed concentration of not less than about 50% solids in a spray dryer apparatus having an inlet air temperature of about 350° F to about 500° F.

4,001,457

METHOD OF MAKING A GASIFIED CONFECTION

Joseph L. Hegadorn, Ridgewood, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed July 1, 1976, Ser. No. 701,835

Int. Cl.² A23G *3/00*

U.S. Cl. 426—572 **9 Claims**

1. A method of making a carbonated candy which comprises:

a. obtaining a hot candy melt,

b. introducing the hot melt into a first pressure vessel,

c. introducing a gas at superatmospheric pressure into the first pressure vessel so that the gas is dispersed within the hot melt,

d. introducing a gas at superatmospheric pressure into a second pressure vessel which has polished inner surfaces at a value equivalent to the pressure within the first pressure vessel, the first and second pressure vessels having a connecting line with valve means between the first vessel and the bottom of the second vessel,

e. transferring the gasified hot melt to the second pressure vessel through the connecting line by opening said valve means and then creating a pressure differential between the two vessels, said differential being effected by regulating the superatmospheric pressure in the second pressure vessel at a value lower than the superatmospheric pressure in the first pressure vessel and venting the top of the second pressure vessel,

f. isolating the second pressure vessel while continuing to maintain a superatmospheric pressure,

g. cooling the second pressure vessel so that the gasified hot melt becomes a gas-containing solid matrix,

h. venting the second pressure vessel which causes the matrix to shatter into multiple fragments, and

i. opening the second pressure vessel to allow the product to be removed.

4,001,458

FRESH LEMON-FLAVORED ALCOHOL BEVERAGE AND METHOD OF PREPARATION

Giuseppe Murolo, New York, N.Y., assignor to Sabastiano Monte; Anya Rejnarowycz and Giuseppe Murolo, all of New York, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,589

Int. Cl.² C12G *3/06*

U.S. Cl. 426—592 **1 Claim**

1. A method for preparing a stable, alcoholic composition having a fresh lemon flavor which comprises (1) adding from about 0.5% to 10% fresh lemon peel to 200 proof ethyl alcohol; (2) permitting this mixture to stand at ambient temperature for approximately 24 hours; and (3) thereafter adding sugar to control sweetness and water to control the proof of the composition.

4,001,459

FIBROUS PROTEIN MATERIALS

Myung Ki Kim, Tarrytown, and Joaquin Castro Lugay, Thornwood, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed June 18, 1974, Ser. No. 480,987

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A23J *3/00*

U.S. Cl. 426—656 **12 Claims**

1. A method for preparing a texturized protein material comprising:

a. preparing a mixture comprising heat coagulable protein and water;

b. cooling the mixture to freeze the water into elongated ice cyrstals and to separate the protein into well-defined, well-ordered, substantially independent zones;

c. freeze drying the frozen mass resulting from the operation of step (b); and

d. heating the resulting freeze dried material to coagulate the protein.

12. A texturized protein material having a well-defined, well-ordered structure comprised of substantially independent protein fibers, the material being prepared according to the process of claim 1.

4,001,460

LIGHT MICROSCOPY PROCESSING METHOD

Thomas D. Kinney, 3120 Devon Road, Durham, N.C. 27707, and John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C. 22705

Division of Ser. No. 463,055, April 22, 1974, Pat. No. 3,892,197. This application Mar. 5, 1975, Ser. No. 555,392

Int. Cl.² A01N *1/02*

U.S. Cl. 427—2 **7 Claims**

1. A method for processing a plurality of individual specimens of tissue to be separately contained while being simultaneously bathed for varying lengths of time in successive selected tissue solutions including melted paraffin so as to fix, dehydrate and clear the specimens preparatory to embedding, comprising:

a. separating the specimens to be processed into groups;

b. installing and physically isolating each group having at least one specimen per group in a respective uniform tissue receptacle which is porous to the extent of having for each of said solutions at least some portion through which the solution may be transferred;

c. installing a plurality of such receptacles in a temperature

controlled and electrically heated processing chamber having a pressure sealable top cover and then sealing the cover;

d. with the receptacles installed, the cover sealed and with the chamber positioned in proximity to a plurality of closed vented containers, each containing a particular tissue processing solution, including melted paraffin in a heated temperature controlled state, selectively and independently connecting each container to the chamber to bring the solutions including the paraffin, with the paraffin being the last solution, in a predetermined sequence to the chamber and for each such solution in the sequence:

1. establishing a vacuum condition in the chamber and
2. establishing a temperature condition in the chamber for maintaining each such predetermined volume at a selected temperature appropriate to such solution,
3. terminating the vacuum and retaining the solution for a predetermined time at a predetermined pressure and temperature, and
4. at the end of each such period of predetermined time, increasing the pressure in the chamber and thereby forcing the used solution back to its respective said container by pressure such that the selected solutions and melted paraffin are separately and independently pumped by application of vacuum and pressure to said chamber and are exchanged with each group of specimens while such specimens are confined in the chamber, held stationary and physically isolated.

4,001,461

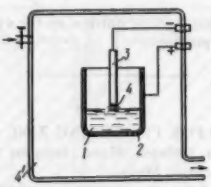
METHOD OF PRODUCING ELECTRODE UNITS FOR PLASMATRONS

David Grigorievich Bykhovsky, Konjushenny pereulok 1/6, kv. 18, Leningrad, U.S.S.R.

Filed Mar. 30, 1973, Ser. No. 346,661

Int. Cl.² B23K *9/04, 9/00*

U.S. Cl. 427—37 **4 Claims**



1. In a method of producing electrode units for plasmatrons, which includes the melting of metal intended for molding an electrode holder, providing a tungsten electrode for melting the metal by the aid of a D-C arc, dipping the electrode into the melt, and withdrawing the electrode and the solidified metal as an electrode unit, the improvement comprising the steps of using the tungsten electrode to act as a cathode; striking the arc prior to the electrode dipping step; maintaining the arc while the electrode is in the melt; and extinguishing the arc after the dipping step but before the withdrawal of the electrode unit.

4,001,462

PROCESS FOR COATING SURFACES HAVING A BASE OF EPOXY RESINS MODIFIED BY UNSATURATED ACIDS AND COATINGS OBTAINED BY MEANS OF SAID PROCESS

Marie Francoise Blin, Antony; Gilbert Gaussens, Saint-Mande, and Francis Lemaire, Clamart, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 11, 1971, Ser. No. 142,277

Claims priority, application France, May 13, 1970, 70.17473

Int. Cl.² B05D *3/06*

U.S. Cl. 427—44 **2 Claims**

1. A method of coating with a coating compound which is hardenable under the action of ionizing radiations consisting essentially on an epoxy resin having hydroxyl groups modified by a stoechiometric excess of from 150 to 250% of unsaturated carboxylic acids as a result of reaction of the COOH groups of the acids with the epoxy bridges of the resin and as a result of esterification of the hydroxyl groups of said resin and has a number of olefinic double bonds on the order of 0.1 to 0.3 per 100 g. of resin wherein said compound is applied directly to a substrate to be coated with a layer which has a thickness within the range of 10 to 100 microns and which is then dried by irradiation.

4,001,463

PROCESS AND APPARATUS FOR THE MANUFACTURE OF RIGID MAGNETIC DISCS

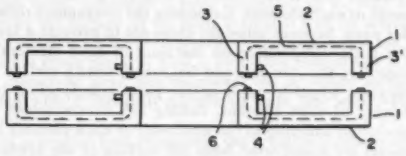
Dieter Schaefer, and Herbert Motz, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 21, 1975, Ser. No. 597,684

Claims priority, application Germany, July 22, 1974, 2435096

Int. Cl.² B05D *3/14;* **B05B** *5/00*

U.S. Cl. 427—48 **7 Claims**



1. In a process for the manufacture of magnetic discs by applying a coating of a pourable fluid dispersion containing finely divided anisotropic magnetic particles in a solution of a binder in an organic solvent, to rigid circular flat base discs of a non-magnetic material, having a circular aperture in the middle, orienting the magnetically anisotropic particles in the layer of dispersion in a preferred direction parallel to the plane of the base disc, converting the coating to a solid hard magnetic layer by drying and curing and subsequently grinding and polishing the magnetic coating, the improvement which comprises: introducing the whole base disc coated with the still fluid magnetic dispersion immediately after applying the coating into the median plane of a uniform magnetic D.C. field produced by the flow of current in conductors so arranged that they run, on both sides of the disc, parallel to the plane of the disc and radially from the central aperture of the disc to the periphery of the disc, the current flowing in opposite directions in the conductors located on either side of the disc, thereby orienting the magnetically anisotropic particles parallel to the plane of the disc and tangentially to its circumference, and, with the disc still in the magnetic field, solidifying the coating.

5. An apparatus for the magnetic orientation of anisotropic magnetic particles dispersed in a solution of a curable binder in an organic solvent, the dispersion being applied to a rigid

circular flat disc of a non-magnetic material having a circular hole at the middle, and the preferred direction of particle orientation being parallel to the plane of the disc and tangential to its circumference, the apparatus comprising conductors which produce a magentic field and which bound a zone of magnetic flux on all sides, the conductors being arranged in the form of a toroidal coil which is split into two halves in the median plane in order to receive the coated circular flat disc, which two halves have contacts, to conduct current, on the surfaces facing each other at the inner and outer peripheries of the coil and means inside the toroidal coil which hold the disc, carrying the coating of magnetic dispersion, in the median plane of the toroidal coil.

4,001,464

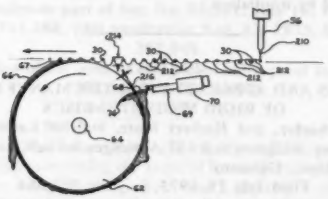
PROCESS FOR FORMING A SOLDER BAND

Ray Charles Doutrich, Lebanon, and Richard Eugene Fry, York, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1975, Ser. No. 572,833

Int. Cl.² B05D *5/12*

U.S. Cl. 427—58 **6 Claims**



4. A process for forming a solder band about a segment of an electrical element comprising, transporting a plurality of elements along a feed path with at least one segment of each element extending transversely of the feed path, extruding a continuous ribbon of a solder paste composition onto said segment of each element, festooning the continuous ribbon of solder paste between adjacent elements to provide a layer of solder paste composition on the sides of each element, and transporting the elements and festoonery onto a surface of an application wheel to apply solder paste compositions to the underside of each element, cutting any excess solder paste composition adhering to the underside of each element as the elements are transported from the surface of the application wheel, heating the segment of each element and the solder paste composition to flow the solder on each element, and cooling the molten solder to form a fused band of solder about said segment of each article.

4,001,465

PROCESS FOR PRODUCING SEMICONDUCTOR DEVICES

Juergen Graul, Gruenwald, and Helmuth Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 28, 1975, Ser. No. 554,164

Claims priority, application Germany, Mar. 1, 1974, 2409910

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

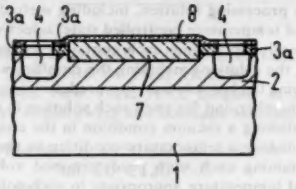
Int. Cl.² H01L *21/76, 27/04*

U.S. Cl. 148—187 **11 Claims**

1. In a process for producing a semiconductor device wherein a trench-like recess is formed in the surface of a Si crystal, a heat-resistant oxidation-blocking layer is applied onto the Si surface at least along one edge of said recess and the Si surface within said recess free of said oxidation-blocking layer is coated with a relatively thick SiO_2 layer via thermal oxidation, the improvement comprising:

confining said heat-resistant oxidation-blocking layer to a strip running directly along the edge of said recess;

applying a layer of SiO_2 directly onto the Si surface at the edge of said oxidation-blocking strip facing away from



said recess, said layer of SiO_2 projecting into said Si surface more deeply than said oxidation-blocking strip; and

subjecting the so-obtained structure to thermal oxidation conditions sufficient to grow a relatively thick SiO_2 layer onto the uncovered Si surface within said recess.

4,001,466

PROCESS FOR PREPARING PRINTED CIRCUITS

Anthony James Shaul, Wokingham, and Edward Russell Wood, Twyford, both of England, assignors to Formica International Limited, London, England

Division of Ser. No. 419,475, Nov. 27, 1973, Pat. No. 3,925,138. This application Oct. 23, 1975, Ser. No. 625,007

Int. Cl.² H05K *3/00;* **C09J** *7/00;* **C23C** *3/02*

U.S. Cl. 427—96 **5 Claims**

1. A process for preparing a printed circuit comprising an insulating substrate carrying a metal layer or pattern, the process consisting essentially of the steps of:

1. substantially fully curing a mixture consisting essentially of (a) an etchable synthetic rubber polymer which, in the substantially fully cured state, is attackable by a chemical etchant solution and (b) a first thermosettable resin, to give a selectively etchable and substantially non-adhesive layer consisting essentially of said rubber and the thermoset resin,
2. superimposing said layer on a fibrous substrate which consists essentially of at least one sheet or web, said sheet or web being impregnated with a second thermosettable resin,
3. consolidating the assembly so produced and curing said second thermosettable resin by heating under pressure to provide an insulating substrate comprising said selectivity etchable layer on the fibrous substrate,
4. chemically etching the surface of said selectively etchable layer, and
5. forming a metal layer or pattern on the etched surface by electroless deposition.

4,001,467

METHOD FOR PRODUCING ZINC ANODE

Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 408,925, Oct. 23, 1973, Continuation-in-part of Ser. No. 199,216, Nov. 16, 1971, abandoned. This application Feb. 24, 1975, Ser. No. 552,709

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01M *13/06*

U.S. Cl. 427—123 **4 Claims**

1. A method for producing an anode assembly which comprises the steps of swelling an aqueous polymer latex with a solvent miscible with water, mixing the swollen latex polymer particles with zinc dust, coating an electrically conductive resin substrate with the thus-formed suspension of zinc dust in

an aqueous latex of swollen particles of a binder polymer, the amount of the binder polymer being about 0.5 to 5 weight

percent based on the weight of the zinc, and drying the coating to form an adherent zinc coating on the substrate.

4,001,468

METHOD FOR COATING SAND CORES AND SAND MOLDS

Michael J. Skubon; John J. Spiwak, both of Columbus, and Rodney L. Naro, Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 464,572, April 26, 1974, Pat. No. 3,922,245. This application Aug. 13, 1975, Ser. No. 604,330

Int. Cl.² B29C *1/04, 1/10*

U.S. Cl. 427—134 **2 Claims**

1. A method of reducing the amount of atmospheric moisture absorbed by a sand core or sand mold comprising coating the exposed surfaces of said mold or core with a wash comprising:

a. an organic liquid solvent having a kauri-butanol value of at least 36;

b. a suspending agent;

c. powdered refractory material selected from the group consisting of graphite, coke, mica, silica, aluminum oxide, magnesium oxide, talc, and zircon flour; and

d. an organic polymer selected from the group consisting of vinyl toluene/butadiene copolymer, styrene/butadiene copolymer, vinyl toluene/acrylate copolymer, styrene-/acetylene copolymers, and acrylate homopolymers,

the ratio by weight of organic polymer to organic liquid solvent being between about 1:50 and about 1:200 and the ratio by weight of powdered refractory to organic liquid solvent being between about 1:2.5 and 1:3.5.

4,001,469

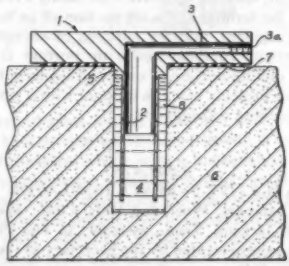
METHOD OF SEALING POROUS MATERIAL DEFINING A RECESS

Jay A. Harvey, East Amherst, N.Y., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,775

Int. Cl.² B05C *7/00*

U.S. Cl. 427—238 **2 Claims**



1. A method of sealing the pores surrounding the interior walls of a recess in a porous material with a thermoplastic impregnating fluid which comprises:

a. partially filling said recess with the thermoplastic impregnating material in a fluid condition in amount compatible with the desired extent of impregnation;

b. inserting for a distance substantially to but short of the bottom of the recess a tubular element substantially smaller in outside diameter than the interior size of the recess to thereby leave an annulus between said tubular means and such recess;

c. centering said tubular element in the recess during insertion by inserting in the recess a flange means attached to and concentric with the tubular element and of substantially the same size and shape as that of the interior of the recess which will be in contact therewith when the tubular element is inserted in the recess;

d. pressure sealing the tubular element and flange means with respect to the top surface through which the recess extends by bearing against said top surface a gasket coextensive with a plate, which is substantially co-planar with said top surface of the porous material and in contact therewith when the tubular element is inserted in the recess, and substantially larger than the interior size of the recess to at least the desired radial extent of impregnation of the thermoplastic material; and

e. forcing the thermoplastic impregnating fluid into the pores surrounding the recess of the porous material by means of pressurized gas which is transmitted to said fluid through a conduit in said plate which communicates with said tubular element.

4,001,470

PROCESS AND BATH FOR THE METALLIZATION OF SYNTHETIC-RESIN

Klaus Schulze-Berge, Remscheid-Luttringhausen, Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Germany

Filed Apr. 16, 1975, Ser. No. 568,733

Claims priority, application Germany, Apr. 18, 1974, 2418654

Int. Cl.² C23C *3/02*

U.S. Cl. 427—304 **9 Claims**

1. In a process for the electroless metallization of a synthetic-resin body, especially a body composed of an ABS resin, whereby the surface of the body is treated with an activation bath containing a metal-deposition catalyzing metal salt of a platinum group metal or gold, a protective colloid and at least one carboxylic acid, and thereafter the activated surface is treated with a chemical metallizing bath, the improvement wherein:

said activation bath contains as the protective colloid, 0.1 to 20 g/liter of gelatin, gum arabic or mixtures thereof;

said activation bath contains, as said carboxylic acid, 1 to 100 g/liter of a polybasic olefinic carboxylic acid;

the pH of the activation bath is adjusted to a value of 1 to 3 with an inorganic acid; and

the treatment with the chemical metallizing bath is effected without an acceleration treatment of the activated surface in a period up to two minutes.

4,001,471

THERMOPLASTIC SEAM BETWEEN JUXTAPOSED EDGES OF BLANK MATERIAL

Kenneth Francis Rumball, Great Bookham, England, assignor to Airfix Industries Limited, London, England

Filed May 28, 1975, Ser. No. 581,671

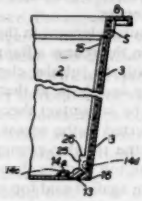
Claims priority, application United Kingdom, June 26, 1974, 28442/74

Int. Cl.² B32B *3/04, 3/20;* **B65D** *5/42*

U.S. Cl. 428—60 **3 Claims**

1. A composite article comprising a seam joining edge regions of sheet material, the seam being formed from thermoplastic material which has been injection moulded in situ in relation to those edge regions, the moulding spanning those

edge regions and being bonded to each and having over one of said edge regions at least and extending along that edge region



a part which is of greater thickness than that part of the moulding overlying the adjacent edge.

4,001,472

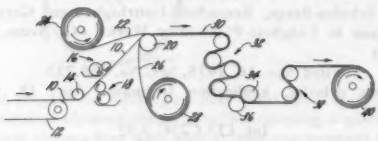
NONWOVEN REINFORCED CELLULOSIC MATERIAL AND METHOD OF PREPARATION

Gordon D. Thomas, and Jerome L. Schwoerer, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 177,782, Sept. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 792,211, Jan. 13, 1969, abandoned. This application Feb. 25, 1974, Ser. No. 445,798

Int. Cl.² B32B *5/10, 5/12, 5/14, 29/02*

U.S. Cl. 428—109 **6 Claims**



1. A soft, limp nonwoven scrim reinforced cellulosic product comprising a cellulosic layer adjacent to and in laminar relationship with a scrim material having crossed sets of threads with open windows therebetween, said cellulosic layer having a pattern of spaced compressed regions disposed adjacent to and extending across both scrim threads and windows with ply attachment between said scrim and cellulosic material being effected by adhesive at only intermittent points on the surface of said scrim material disposed adjacent compressed regions of the cellulosic layer, said cellulosic layer between said compressed regions being in its uncompressed state to provide fluid transmitting channels adjacent to and extending across both the scrim threads and windows, and to provide bulk, an embossed surface texture, and enhanced absorbency hand and limpness.

4,001,473

SOUND ATTENUATING STRUCTURAL HONEYCOMB SANDWICH MATERIAL

Billy G. Cook, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Feb. 19, 1976, Ser. No. 659,339

Int. Cl.² B32B *3/12*

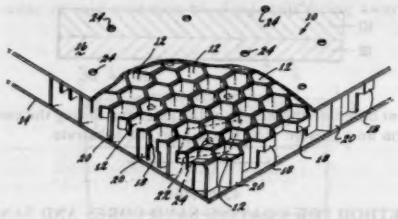
U.S. Cl. 428—116 **6 Claims**

1. A sound attenuating structural honeycomb sandwich material comprising:

an imperforate face sheet:

a honeycomb core structure having a multiplicity of adjacent cells, arranged in groups, the cells within said groups have inner walls of a length shorter than the thickness of said core thereby forming enclosed multiple cell areas, said imperforate face sheet being attached to the faying edges of said core adjacent said enclosed multiple cell areas; and

a perforated face sheet attached to the faying edges of said core remote from said imperforate face sheet and



wherein each perforation of said perforated face sheet communicates only with one of said enclosed multiple cell areas.

4,001,474

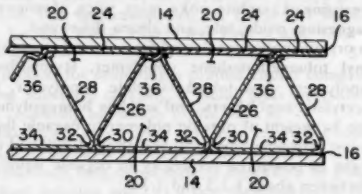
HONEYCOMB PANEL CELLULAR STRUCTURE HAVING TRIANGULAR CELLS

Ralph F. Hereth, Port Orchard, Wash., assignor to Wilkins & Associates, Inc., Tacoma, Wash.

Filed Aug. 26, 1974, Ser. No. 500,642

Int. Cl.² B32B *3/12*

U.S. Cl. 428—116 **10 Claims**



1. A honeycomb cellular structure comprising a plurality of serially arranged triangular cross-section cell segments individually formed and secured together, each said cell segment including three flat sides forming three tip portions therebetween, a substantially flat leg portion projecting from one of said tip portions in a plane parallel to a plane defined by the flat side extending between the remaining said tip portions, said leg porion extending for a sufficient distance to directly contact the corresponding one tip portion of the next succeeding cell segment, said one tip portion including a recessed area for receiving the terminus of a leg portion of an immediately adjacent cell segment, said leg portions of all cell segments being substantially coplanar and a tip portion in the plane opposite said one tip portion of each cell segment from which the leg portion projects being in contact with a tip portion of the next succeeding cell segment.

4,001,475

ABLATIVE SURFACE INSULATOR

Joseph W. Chambers, Woodland Hills, Calif., and Lester E. McTaggart, Jackson, Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,330

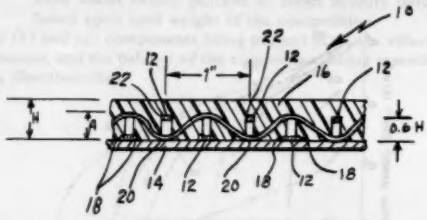
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B32B *1/00*

U.S. Cl. 428—175 **4 Claims**

1. An ablative surface insulation for withstanding extreme temperature comprising a plurality of interwoven strips of metal capable of withstanding temperatures in excess of 700°F

fixedly secured to a base material which is incapable of withstanding said extreme temperature, said strips being formed in a convoluted design producing a diagonal matrix having nodes and peaks, said nodes of said strips in one direction matching



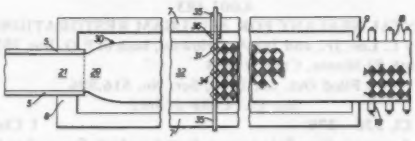
said peaks in another direction, a silicone elastomeric insulating material molded to and encompassing said plurality of strips and said convoluted strips having a pitch of approximately 1 inch and having an amplitude equal to approximately 0.6 the height of said insulating material.

4,001,476

MANUFACTURE OF FLOAT GLASS

William Ramsey Maltman, Prescot, and Colin Robert Howard, Liverpool, both of England, assignors to Pilkington Brothers Limited, Liverpool, England

Division of Ser. No. 287,716, Sept. 11, 1972, Pat. No. 3,850,605. This application Aug. 20, 1974, Ser. No. 498,927
The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.
Claims priority, application United Kingdom, Sept. 17, 1971, 43507/71
Int. Cl.² C03B *18/02*; **C03C** *21/00*; **B32B** *15/08, 17/06*
U.S. Cl. 428—209 **36 Claims**



1. Patterned glass having patterned surface modification produced by a process comprising locating in contact with the surface of the glass which is at a temperature at which it is electrically conductive, a molten body of an electrically conductive material for modifying the glass which body is shaped to a configuration progenitive of a pattern to be introduced into the glass, effecting relative movement between the shaped molten body and the glass, connecting an electrical supply to the molten body and to the glass, and switching that supply to engender electrically a predetermined ionic migration between the molten body and the glass in a time period during said relative movement, said time period being defined by a supply pulse width of the switched supply which is related to the speed of said relative movement and is sufficient to produce a pattern element of modified glass in said glass surface which pattern element exhibits its derivation from the configuration of the molten body.

4,001,477

FLAME RESISTANT CLOTH

James Economy, Eggertsville; Francis J. Frechette, Tonawanda, and Luis C. Wohrer, Lewiston, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 107,484, Jan. 18, 1971, abandoned, which is a division of Ser. No. 764,935, Oct. 3, 1968, Pat. No. 3,628,995. This application July 12, 1973, Ser. No. 378,760
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² D03D *25/00*; **D04B** *1/16*
U.S. Cl. 428—224 **6 Claims**

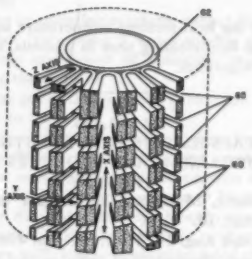
1. A flame resistant fabric comprising infusible fibers of cured resin condensation products of phenols and aldehydes blended with fibers selected from the group consisting of animal fibers, polyamide fibers, polyacrylonitrile fibers, flurocarbon fibers, glass fibers, mineral fibers, cotton fibers, rayon fibers, polyester fibers, polyolefin fibers, polyvinyl fibers, and mixtures thereof.

4,001,478

THREE-DIMENSIONAL FABRIC MATERIAL

Robert W. King, Chelmsford, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Continuation of Ser. No. 675,367, Oct. 16, 1967, abandoned. This application Jan. 24, 1972, Ser. No. 220,510
Int. Cl.² D06M *17/00*
U.S. Cl. 428—257 **3 Claims**



1. A filamentary three-dimensional material comprising:
a. a group of filaments oriented substantially parallel to each other on a Z axis in two groups of intersecting rows defining an X axis and a Y axis;
b. a second group of filaments woven on said X axis extending through said oriented filaments in courses which are at an angle to said Z axis;
c. a third group of filaments woven on said Y axis extending through said oriented filaments in course contiguous with said X axis courses; and
d. said filaments being sized and spaced relative to each other such that the filaments on each axis are compressed into close frictional contact with the adjacent filaments on each other axis to bind said material into an integral structure having a density of at least 30% of the density of said filaments.

4,001,479

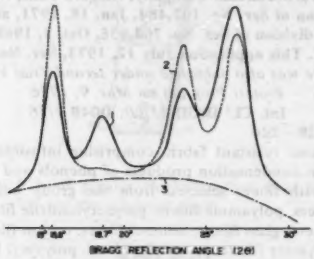
NOVEL NAPHTHALATE POLYESTER FIBERS, AND THEIR END USES

Isao Hamana; Yoshio Fujiwara, and Shiro Kumakawa, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 400,905, Sept. 26, 1973, abandoned, which is a continuation of Ser. No. 242,636, April 10, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,639
Claims priority, application Japan, Aug. 2, 1971, 46-58124; Apr. 14, 1971, 46-23677
Int. Cl.² B32B *27/04*
U.S. Cl. 428—272 **6 Claims**

1. An electric insulating material consisting of a fibrous

cloth, said fibrous cloth being obtained by heat-treating a fibrous cloth consisting mainly of naphthalate polyester fiber consisting of a naphthalate polyester containing at least 85 mol % of ethylene-2,6-naphthalate units and having an intrinsic viscosity of 0.3 to 1.0, said fiber having a diffraction intensity ratio (R) between a Bragg reflection angle $2\Theta = 18.7°$ and $2\Theta = 15.6°$, as determined by the X-ray diffraction method in the range of 0.15 to 1.73, such that the heat-treating time and temperature satisfy the following equations (1) and (2)



T-200	$\geqq 70\ e^{-2.1\times10^{4}/t}$	(1)
T-200	$\geqq 70\ [1-e^{-(6.6\times10^{2})/t}]$	(2)

wherein T is the heat-treating temperature in degrees Centigrade, t is the heat-treating time in seconds, and e is the base of a natural logarithm.

4,001,480
ENCAPSULATION PROCESS UTILIZING MICROORGANISMS AND PRODUCTS PRODUCED THEREBY

Joseph L. Shank, Matteson, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Aug. 16, 1974, Ser. No. 498,208
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976
Int. Cl.² B41M *5/02*; **C12D** *13/08*
U.S. Cl. 428—411 **20 Claims**

1. An encapsulation process comprising the steps of: growing a fungus under conditions that produce a fungus having a fat content of about 40 to 60% by weight, passing a fat-soluble substance into the fat within the grown fungus by placing said fungus into contiguous contact with said substance to thereby encapsulate said substance, said fat-soluble substance being passively retained within said fat and not being a natural constituent of the fungus; and harvesting said encapsulated substance.

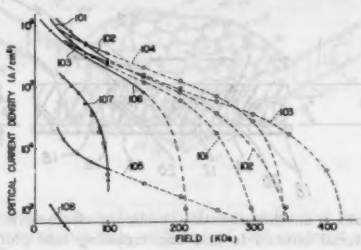
3. The process of claim 1, wherein the fat-soluble substance is a dye, a lubricant, a flavor, an aroma, or an adhesive.

4,001,481
SUPERCONDUCTIVE ELEMENTS AND METHOD FOR PRODUCING THE SAME

Yoshinobu Tarutani, Kokubunji; Ushio Kawabe; Mitsuhiro Kudo, both of Hamura, and Sadanori Taguchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 5, 1973, Ser. No. 403,883
Claims priority, application Japan, Oct. 6, 1972, 47-99801; Jan. 10, 1973, 48-5217
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² B05D *5/12*; **B32B** *15/04*; **C23C** *13/02*
U.S. Cl. 428—469 **19 Claims**

1. A superconductive element comprising a substrate, at least one face portion of which is composed of alumina, and a layer of a superconductive material formed to cover said face portion composed of alumina, said superconductive material consisting essentially of an intermetallic compound selected from the group consisting of a compound represented by the formula $Nb_j(Al_{1-x}Ge_x)$ in which the value of j is within a range of from 2.3 to 4.0 and the value of x is within a range of from 0 to 0.5, and a compound represented by the formula $Nb_k(Ga_{1-x}Al_x)$ in which the value of k is within a range of from 2.3 to 4.9 and the value of x is within a range of from 0 to 0.5.



4,001,482
PREPARATION OF VINYL HALIDE-CONTAINING POLYMERS

Peter A. Schwab, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 30, 1975, Ser. No. 572,983
Int. Cl.² C08F *2/18, 2/44, 14/06*
U.S. Cl. 526—73 **12 Claims**

1. A method of preparing vinyl halide-containing polymers, which contain a reduced amount of unreacted vinyl halide, by an improvement in the suspension polymerization of a monomer selected from the group consisting of a vinyl halide and a mixture of a vinyl halide and a monomer copolymerizable therewith, said improvement comprising polymerizing the monomer in the presence, of about 0.1 to about 10 parts, per 100 parts of monomer, of a plasticizer, at a temperature in the range of about 38° to about 71° C., to a conversion level of at least 60 percent, thereupon increasing the temperature about 14° to about 62° C., with the additional characteristic that the increased polymerization temperature does not exceed 100° C.

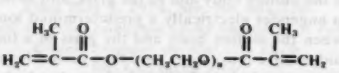
4,001,483
DENTAL SEALANT FOR AMALGAM RESTORATIONS

Henry L. Lee, Jr., and Jan A. Orlowski, both of P.O. Box 3836, South El Monte, Calif. 91733

Filed Oct. 22, 1974, Ser. No. 516,886
Int. Cl.² C08F *218/02*
U.S. Cl. 526—270 **1 Claim**

1. A composition for use as a dental sealant, for sealing the dental margin between a tooth structure and an amalgam restoration, that is characterized by good ability to penetrate a space between the tooth structure and the amalgam restoration, and that is packaged in two separate packages, each of which remains in its curable state as packaged but that upon mixing one with the other upon application to a dental margin, cures in about two minutes at room temperature, and that as mixed comprises a curable composition of:

a. an alkylene glycol dimethacrylate of the formula



wherein n is an integer from 2 to 4, inclusive;

b. a polymerization initiator;

c. a polymerization accelerator; and

d. an additive secondary monomer selected from the group consisting of
glycidyl methacrylate and
tetrahydrofurfuryl methacrylate, in the concentration from about twenty percent to about seventy percent based upon total weight of the composition,

the (b) and (c) components being present in minor, effective amounts, and the balance of the composition being essentially the dimethacrylate.

4,001,484

TRANSPARENT SOLVENT AND HEAT RESISTANT TERPOLYMER COMPOSITIONS

Il H. Song, Lombard, Ill., assignor to The Richardson Company, Des Plaines, Ill.

Filed May 20, 1974, Ser. No. 471,488
Int. Cl.² C08F 220/14
U.S. Cl. 526—329 2 Claims

1. A transparent, solvent resistant, high heat terpolymer composition comprising the reaction product of (a) a vinyl aromatic monomer selected from the group consisting of α-methylstyrene, 2-methylstyrene and tertiary butylstyrene, (b) methyl methacrylate, and (c) acrylonitrile or methacrylonitrile monomers polymerized at polymerization conditions to produce a terpolymer having a weight ratio of said vinyl aromatic to methyl methacrylate to acrylonitrile or methacrylonitrile units of from about 30 to 35: 55 to 65: and 5 to 10 respectively, said composition having less than about 0.5 percent by weight unreacted monomer of any of the initial reactants, said composition being further characterized by having an annealed heat distortion temperature at 264 psi greater than 250° F. as determined by ASTM D-648-72 test.

4,001,485

PROCESS FOR SPINNING ACRYLIC POLYMERS

Luigi Patron, Venice; Pier Luigi Mazzuco, Favar Veneto (Venice); Favato Veneto, Mestre; Enzo Trevisan, Mestre (Venice), and Ennio Niero, Mirano (Venice), all of Italy, assignors to Montefibre S.p.A., Milan, Italy

Filed Nov. 26, 1974, Ser. No. 527,259
Claims priority, application Italy, Nov. 29, 1973, 31931/73
Int. Cl.² D01F 6/18; C08F 220/42
U.S. Cl. 526—341 9 Claims

1. In a process for the wet-spinning of acrylic polymers wherejn a spinning solution of an acrylic polymer in an organic solvent consisting essentially of dimethylacetamide is extruded through a spinneret into a coagulating bath consisting essentially of water and dimethylacetamide in a ratio between 30:70 and 60:40 by weight, and wherein the filaments thus obtained are washed, stretched and heat treated, the improvement wherein the coagulating bath contains from 0.03% to 3% by weighht of acetic acid and has added thereto an alkaline compound so as to bring about a pH value greater than 5.

4,001,486

LATEX COAGULANT FOR EMULSION BREAKERS

Kenneth G. Phillips, River Forest, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed June 11, 1975, Ser. No. 586,111
Int. Cl.² C08F 6/22
U.S. Cl. 528—492 6 Claims

1. A method for coagulating synthetic rubber particles from a synthetic rubber latex using a water-soluble epichlorohydrin-dimethylamine copolymer of molecular weight 200 to 2,000 comprising the steps of:

A. Adjusting the pH of the synthetic rubber latex within the range of 1.5 to 7.0;

B. Adding an amount of the epichlorohydrin-dimethylamine copolymer sufficient to coagulate the synthetic rubber latex with the mole ratio of epichlorohydrin to dimethylamine being within the range of from 0.75 to 0.98;

C. Thoroughly dispersing the epichlorohydrin-dimethylamine copolymer within the synthetic rubber latex for a period of time sufficient to form coagulated rubber particles; and,

D. Recovering the coagulated synthetic rubber particles.

4,001,487
SYSTEM FOR SUPPLYING CURRENT TO A GROUP OF HIGH-CURRENT RESISTANCE FURNACES THROUGH A PLURALITY OF TRANSFORMERS

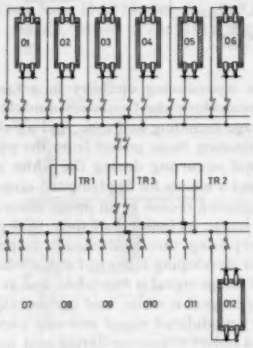
Otto Schumacher, Biberbach, and Hans Jonas, Gersthofen, both of Germany, assignors to Sigri Elektrographit GmbH, Augsburg, Germany

Filed July 1, 1975, Ser. No. 592,217

Claims priority, application Germany, Aug. 13, 1974, 2438742

Int. Cl.² F27D *11/04*

U.S. Cl. 13—24 **5 Claims**



1. System for supplying current to a group of high-current resistance furnaces which comprises a number of transformers switchingly connectible in sequence individually and in a plurality thereof in parallel to selective furnaces of the group thereof, the group of furnaces being subdivided into two subgroups of furnaces, each of said subgroups having one of said transformers associated therewith, and said number of transformers including a third transformer selectively switchingly connectible in parallel to the one and the other of the two subgroups of furnaces.

4,001,488
APPARATUS FOR FEEDING CHARGE TO AN ELECTRIC SMELTING FURNACE

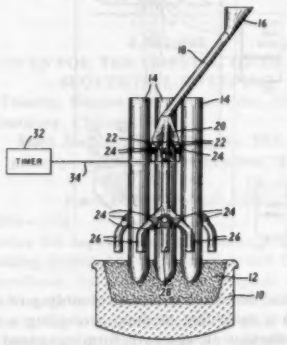
William Bruff, and Ole Andreas Kongsgaarden, both of Vagsbygd, Norway, assignors to Elkem-Spigerverket, Oslo, Norway

Filed Dec. 19, 1975, Ser. No. 642,379

Claims priority, application Norway, Dec. 19, 1974, 4581/74

Int. Cl.² F27D *3/10*

U.S. Cl. 13—33 **6 Claims**



1. An electric smelting furnace comprising:

a. a furnace pot adapted to contain a charge;

b. a plurality of electrodes adapted to extend into the charge within said furnace pot;

c. apparatus for feeding particulate charge material of varying particulate size to said charge, said apparatus comprising:

i. a single hopper for said particulate charge;

ii. a single feed chute having first and second ends, the first end being connected to the hopper;

iii. a plurality of charging chutes each of which has first and second ends, the first end of each of which is in communication with the second end of said feed chute;

iv. a valve associated with each said charging chute towards the first end thereof, each said valve being operative between a first position in which the said charging chute is substantially obstructed and a second position in which said charging chute is substantially unobstructed;

v. means for sequentially operating each said valve.

4,001,489
SUBMARINE POWER CABLE GROUNDING MEANS AND METHOD

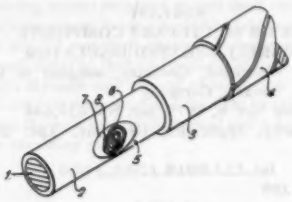
Jack Raymond Pedersen, Ekholt, and Lars Arthur Aanerud, Strommen, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,239

Claims priority, application Norway, Dec. 17, 1974, 4544/74

Int. Cl.² H01B *7/14, 9/02;* **H05K** *3/00*

U.S. Cl. 174—10 **13 Claims**



11. A power cable having a core surrounded by at least one layer forming a metallic sheath for said core and at least one layer of insulating material surrounding said metal sheath and at least one armoring layer around said insulated layer and means for electrically interconnecting said metal sheath and said armoring layer comprising: electrically conductive grounding means consisting of at least one metal wire electrically connected to said metal sheath prior to the application of said insulating layer, said metal wire leading from said metal sheath through a sealed hole formed in said insulating layer and electrically connected to said armoring layer.

4,001,490
STRIP BUS BAR FOR TERMINAL POSTS

James Edward Lynch, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 480,899, June 19, 1974, abandoned. This application July 1, 1975, Ser. No. 592,139

Int. Cl.² H01R *31/08, 5/04*

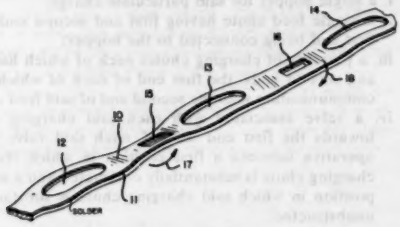
U.S. Cl. 174—88 R **10 Claims**

9. A bus bar for electrically connecting together a plurality of terminal posts mounted upon a base in a predetermined pattern and comprising:

a first layer of conductive material having a first and a second plurality of holes formed therein in a pattern which corresponds to the pattern of the terminal posts upon which said bus bar is to be mounted;

each of said first plurality of holes being sufficiently large to provide complete electrical separation between the bus bar and the terminal posts to be passed therethrough;

the sections of said bus bar immediately surrounding successive ones of said second holes being bent in opposite rotational directions primarily about an axis substantially coincident with the main longitudinal axis of said bus bar;



each of said second holes in said rotationally bent sections of said bus bar being of a size and configuration to provide physical interference between the edges of said second holes and the terminal posts to be passed therethrough to create opposing torque forces upon said terminal posts to be passed therethrough.

4,001,491

ONE OR MULTI-PART COMPOSITE UMBRELLA-SHAPED INSULATOR

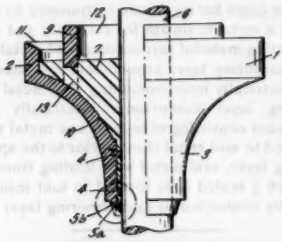
Ewald Bauer, Wunsiedel, Germany, assignor to Rosenthal Technik AG, Bavaria, Germany

Filed Nov. 6, 1975, Ser. No. 629,644

Claims priority, application Germany, Apr. 29, 1975, 2519007

Int. Cl.² H01B *17/60, 19/00*

U.S. Cl. 174—209 **9 Claims**



1. A composite insulator, comprising:

an elongated support trunk;

a hollow, generally umbrella-shaped casting mould comprised of a synthetic material and extending annularly around and being gap spaced from said trunk; said mould narrowing gradually from said umbrella shape to a tubular socket part around said trunk; centering aids internally of said socket part for defining a gap space between said socket part and said trunk; means sealing said mould at the end thereof beyond said socket part;

a cavity including said gap space being defined between said mould and said trunk;

a hardenable synthetic material at least partly filling said cavity; said hardenable synthetic material having similar elastic and thermal properties to said mould synthetic material, and said mould being integrally joined to and being a nonremovable part of said insulator.

4,001,492

HALF TONE REPRODUCING PROCESS IN FACSIMILE

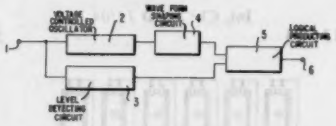
Matsumi Suzuki, and Toshi Itoh, both of Tokyo, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1973, Ser. No. 330,071

Claims priority, application Japan, Feb. 8, 1972, 47-13317

Int. Cl.² H04N *1/38*

U.S. Cl. 358—283 **2 Claims**



1. Half tone reproducing circuitry in a facsimile system comprising a means for pulse frequency modulating the image signal of an image including half tone, and a pulse eliminating means for eliminating those pulses from the pulse frequency modulated signal occurring during the white portion of the image signal; and a means for applying the output signal from said pulse eliminating means to an image recording device to reproduce the image including half tone, said pulse eliminating means comprising threshold means responsive to said image signal for developing a control signal which is at a first level when said image signal is non-white and at a second level when said image signal is white; and means responsive to the pulse frequency modulated signal and said control signal for eliminating said pulses occurring during said white portion of said image signal when said control signal is at said second level.

4,001,493

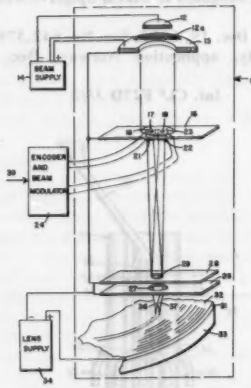
SINGLE LENS, MULTI-BEAM SYSTEM AND METHOD FOR HIGH RESOLUTION RECORDING OF INFORMATION ON A MOVING RECORDING MEDIUM AND ARTICLE

Donald R. Cone, Palo Alto, Calif., assignor to Nihon Denshi Kabushiki Kaisha and Sharp Kabushiki Kaisha, both of, Japan

Filed Sept. 3, 1974, Ser. No. 502,558

Int. Cl.² H04N *5/76*

U.S. Cl. 358—127 **9 Claims**



1. In a method for electron beam recording of wideband information on a recording medium, providing a recording electron beam directed along a path, forming spaced beams by intercepting said beam with an object mask having spaced apertures formed therein, selectively and independently controlling the positioning of each of said electron beams as a

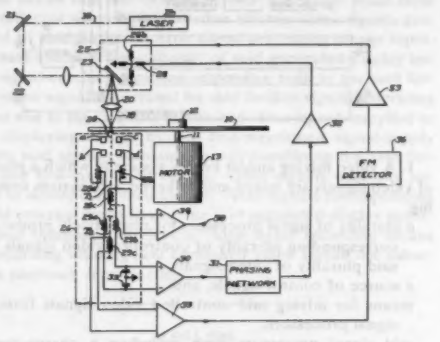
function of the information to be recorded, focusing said beams on the recording medium by a single electromagnetic lens to image the beams leaving said lens on said recording medium and moving said recording medium to expose sequential portions of said medium to said electron beams.

4,001,494

PHOTORECEPTOR MATRIX FOR OPTICAL VIDEO PLAYBACK SYSTEM

Robert Adler, Northfield, and John L. Rennick, Elmwood Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 519,897
Int. Cl.² H04N *5/76;* **G11B** *7/00*
U.S. Cl. 358—127 **8 Claims**



1. In an optical readout system for scanning a video record with a reading beam of energy to derive information stored in a track on said record, a photoreceptor matrix comprising:

four photoreceptors *a*, *b*, *c* and *d* with (*a*,*b*) arranged as a tandem pair along the direction of said track and with (*c*,*d*) also arranged as a tandem pair along the direction of the track, said pairs being symmetrically disposed on opposite sides of a reference plane that extends along the direction of said track and is coincident with the axis of said beam and tangent to said track at the point where it is scanned by said beam, with photoreceptors *a* and *c* having a leading relationship relative to said reading beam and photoreceptors *b* and *d* having a lagging relationship thereto; and

first circuit means coupled to all of said photoreceptors for differentially combining the output signals thereof of said photoreceptors to develop a radial error correction signal $(a+b)-(c+d)$ having a polarity and amplitude related to the sense and degree of radial tracking misregistration.

4,001,495

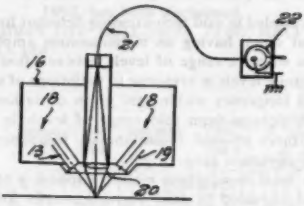
DEVICES FOR THE COPYING OF IMAGES BY SEQUENTIAL SWEEPING

Julio G. Tauszig, Buenos Aires, Argentina, assignor to A. B. Dick Company, Chicago, Ill.

Filed June 19, 1975, Ser. No. 588,312
Claims priority, application Argentina, July 15, 1974, 254689
Int. Cl.² H04N *1/06, 1/24*
U.S. Cl. 358—294 **5 Claims**

1. A device for copying indicia from an original document onto recording material to produce a stencil for reproducing copies therefrom, by scanning the original document and burning the image in accordance therewith into the recording material including a support for the original and the stencil recording material, optical means for scanning the original, means for converting a light image produced by said optical means into electrical signals and means coupled electrically to said converting means for burning said image into said stencil recording material in accordance with said signals, wherein said optical means includes in combination:

housing means defining first and second channels, the second channel being cylindrically shaped with a light reflecting wall and extending inwardly of said housing from a first outer wall at a predetermined angle with respect thereto, adjacent which an original document is placed for copying, said second channel intersecting said first channel transversely with respect thereto, lamp means mounted in said first channel, said second channel being open throughout the length thereof between said lamp and said document so that light from said lamp passes unfocused from said lamp to said document, at least a



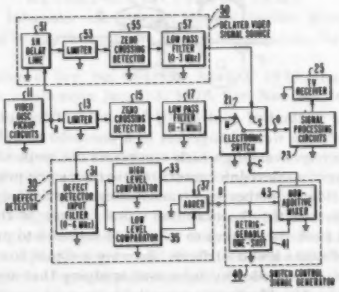
portion of said light being reflected by said channel means said housing mans defining a third channel adjacent said second channel extending from said first outer wall into said housing substantially perpendicular to the plane of said outer wall, light focusing means and light receiving means mounted in said third channel, said light receiving means being coupled to said converting means, said second and third channels being positioned relative to each other so that said unfocused light from said lamp passes through said second channel onto said indicia of said original document and the light image of said indicia passes through said third channel and is focused onto said light receiving means.

4,001,496

DEFECT DETECTION AND COMPENSATION APPARATUS FOR USE IN AN FM SIGNAL TRANSLATING SYSTEM

Jon Kaufmann Clemens, Skillman; Jack Selig Fuhrer, Princeton Junction, and Michael David Ross, Somerdale, all of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 477,102, June 6, 1974, abandoned.
This application July 9, 1975, Ser. No. 594,429
Int. Cl.² H04N *5/76;* **G11B** *9/06*
U.S. Cl. 358—127 **14 Claims**



1. In a signal translating system including a source of carrier waves the instantaneous frequency of which is subject to variation over a given deviation range in accordance with the amplitude of a desired signal of a given bandwidth, said source

being randomly subject to occasions of defective operation during which the apparent instantaneous frequency of said carrier waves departs from said given deviation range; frequency modulation detecting means coupled to said source, said detecting means including a zero-crossing detector, and a low pass filter, coupled to said zero-crossing detector and having a passband substantially limited to said given bandwidth, for providing a demodulated signal having an amplitude normally corresponding to the amplitude of said desired signal but subject to spurious amplitude variations during said occasions of defective operation; signal utilization means; and means for normally supplying the demodulated signal output of said low pass filter to said signal utilization means; a defect detection and compensation system comprising, in combination:

means coupled to said zero-crossing detector for deriving an output signal having an instantaneous amplitude which varies within a range of levels between first and second amplitude levels in response to variations of said instantaneous frequency within said given deviation range, and which departs from said range of levels in response to departures of said instantaneous frequency from said given deviation range;

voltage level comparison means responsive to the output signal provided by said deriving means for developing impulses in response to departures of said output signal from said range of levels; and

means responsive to the impulses developed by said voltage level comparison means for disabling said demodulated signal supplying means.

4,001,497

MONITORING OF WELDING

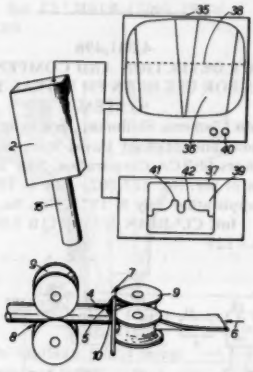
Clive James Arthur Bosworth, Kettering, England, assignor to British Steel Corporation, London, England

Filed May 24, 1974, Ser. No. 473,042

Claims priority, application United Kingdom, June 18, 1973, 28873/73

Int. Cl.² H04N 7/18

U.S. Cl. 358—101 **5 Claims**



1. In a method of controlling thermal profiles across metal surfaces to be welded together in a continuous welding process, the improvement which comprises the steps of viewing, by means of a television camera, the surfaces just prior to their being welded together and transmitting electrical signals representative of the thermal and visual images of the viewed surfaces from the camera to a cathode ray tube to produce an image of said viewed surfaces, deriving a signal from a raster line of said cathode ray tube and applying that signal as an input to an oscilloscope to produce on said oscilloscope a visual wave form representative of the thermal profile existing across said viewed surfaces, observing said visual wave form and, in response to that observation, controlling heating means applied to said surfaces to adjust said thermal profile to a desired form.

4,001,498

VIDEO MIXING AND/OR KEYING SYSTEM

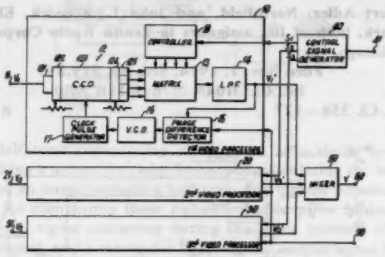
Masanobu Morishita; Hidehiko Inoue; Takao Ando, and Mitsuru Kawasaki, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 602,150

Claims priority, application Japan, Aug. 7, 1974, 49-90493

Int. Cl.² H04N 5/22

U.S. Cl. 358—160 **5 Claims**



1. A video mixing and/or keying system in which a plurality of video signals are mixed and/or keyed, said system comprising:

a plurality of signal processors for respectively producing a corresponding plurality of controlled video signals from said plurality of video signals,

a source of control signals, and

means for mixing said controlled video signals from said signal processors,

said signal processors each including a charge-coupled device for delaying one of said video signals in response to a driving pulse; means for producing a phase difference signal representative of the phase difference between said delayed video signal and a reference signal, the frequency of said driving pulse being controlled by said phase difference signal; and means including means for converting the charge transferred in said charge-coupled device for controlling the amplitude of said delayed video signal in response to an assigned one of said control signals.

4,001,499

DISPLAY SYSTEMS

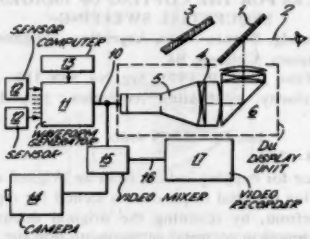
Kenneth J. Dowell, Edgware, England, assignor to Smiths Industries Limited, London, England

Filed Mar. 26, 1975, Ser. No. 562,365

Claims priority, application United Kingdom, Mar. 29, 1974, 14073/74

Int. Cl.² H04N 7/02

U.S. Cl. 358—93 **7 Claims**



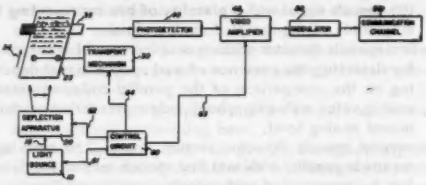
1. In a head-up display system which is for use in a aircraft and which includes a partially-transparent reflector for mounting in the line-of-sight of the pilot of the aircraft so that the pilot's view of a scene external to the aircraft is along said

line-of-sight through said reflector, means for generating electric video signals in accordance with a display for presentation to the pilot, displaying means, and signal-supply means for supplying said electric video signals to said displaying means, said displaying means responding to said electric video signals supplied thereto by said signal-supply means to project an image of said display onto said reflector so as to present said generated-display image in said line-of-sight against the background of the said external scene through said reflector, the improvement wherein the system also includes further electric signal-generating means for generating further electric video signals in accordance with a scene viewed thereby, means mounting the said further electric signal-generating means to view substantially the same external scene as viewed by the pilot along said line-of-sight through said reflector, said mounting means mounting said further signal-generating means out of said line-of-sight to view said scene apart from said reflector whereby said further electric video signals generated by said further electric signal-generating means represent said external scene devoid of said generated-display image, signal-combining means responsive both to the said further video signals generated by said further signal-generating means and to the said first-mentioned video signals supplied to said displaying means by the first-mentioned signal-supply means, said signal-combining means combining the said further and first-mentioned electric video signals with one another to derive combined electric video signals corresponding to said external scene having the said generated display superimposed thereon, and electric video-signal recording means for recording utilizing said combined video signals for subsequent playback reproduction.

4,001,500
AMPLIFIER FOR USE IN A DOCUMENT SCANNING SYSTEM

Lawrence P. Lavery, Fairport, and David R. Shuey, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1974, Ser. No. 525,694
Int. Cl.² H04N 3/10, 5/16
U.S. Cl. 358—282 **9 Claims**



1. In a document scanning system including means for repetitively sweeping a beam of light generated by a light source along a line-like scanning station in a scanning direction and a retrace direction, means for turning off said light source during the interval that said light beam is moving in said retrace direction, means generating a retrace signal during said interval, and photosensitive means positioned at said scanning station to collect light reflected from a document at said scanning station and provide an electrical signal proportional to the amount of said reflected light, amplification means for providing an output signal representative of the information content of a scanned document, said amplification means comprising

current amplifier means coupled to said photosensitive means for amplifying said electrical signal,

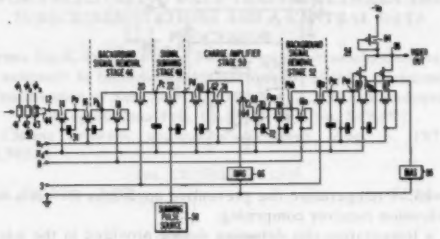
black level adjustment means operative in response to said retrace signal for controlling the output of said current amplifier means so as to compensate for leakage current from said photosensitive means, and

background control means responsive to variations in the output of said current amplifier means for adjusting the range of said variations to a predetermined range to compensate for differences of background of different scanned documents.

4,001,501
SIGNAL PROCESSING CIRCUITS FOR CHARGE-TRANSFER, IMAGE-SENSING ARRAYS

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 356,324, May 2, 1973, Pat. No. 3,876,952.
This application Sept. 18, 1974, Ser. No. 507,217
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.² H04N 3/14; H01L 29/78, 31/00; H01J 39/12
U.S. Cl. 358—160 **2 Claims**



1. A method for improving the contrast among a plurality of charge signals concurrently produced by a corresponding plurality of radiation sensors of an image sensing array, each charge signal representing the intensity of a different element of the scene being viewed by said array, comprising the steps of:

discarding that portion of each charge signal which is lower than a given amplitude level corresponding to a given background signal level;

employing the remainder of each charge signal as the signal representing the radiation received by the radiation sensor producing that signal; and

increasing the signal intensity at the expense of signal resolution by combining into a single charge signal, each group of N such remainder signals derived from N adjacent radiation sensors, respectively, where N is an integer greater than one.

4,001,502
STRAYLIGHT COMPENSATION CIRCUIT AND BLANKING CIRCUIT FOR SAME

Frederik Johannes van Roessel, Upper Saddle River, N.J., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 564,732, April 3, 1975, abandoned.
This application June 24, 1975, Ser. No. 589,765
Int. Cl.² H04N 5/16
U.S. Cl. 358—165 **6 Claims**

1. A blanking circuit for a video signal having video and blanking portions, said circuit comprising an inverting amplifier having an input means for receiving said signal and an output; an output terminal; a first diode coupled between said output terminal and said amplifier output, means for providing feedback coupled between said diode and said amplifier input means; means for maintaining said feedback during said blanking portion coupled between said diode and said amplifier input, and means coupled to said diode and having input means for receiving a blanking signal for biassing said diode to clip said signal at a reference potential during the blanking portion and for biassing said diode at some other potential during the video portion.

4,001,503

TEMPERATURE-RISE PREVENTIVE APPARATUS FOR TELEVISION RECEIVER PARTS

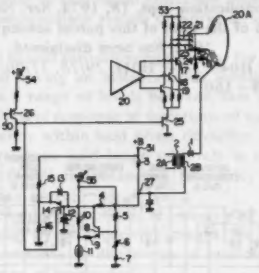
Yoshihisa Nomoto, Tokyo; Shigeru Takegami, Yokohama; Koichi Nakakubo, Yokohama, and Takao Yoneyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,953

Claims priority, application Japan, Oct. 16, 1973, 48-116178

Int. Cl.² H04N *5/44*; **H01J** *31/26, 29/52*

U.S. Cl. 358—243 **13 Claims**



13. A temperature-rise preventive apparatus for parts of a television receiver comprising:

a temperature-rise detecting device provided in the television receiver for producing an output signal which varies in accordance with the temperature-rise in said receiver when it exceeds a predetermined temperature value;

an average beam current reduction device coupled with the output signal of said detecting device for reducing the average beam current of said receiver in accordance with the output signal below the value of the average beam current prior to the predetermined temperature value being exceeded, whereby the greater the temperature-rise, the less the average beam current becomes, thereby preventing the temperature in said receiver from rising.

4,001,504

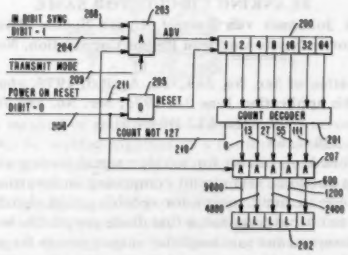
AUTOMATIC TERMINAL DATA RATE SELECTION

Thomas Allen Hendrickson, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 9, 1975, Ser. No. 585,001

Int. Cl.² H04L *15/00*

U.S. Cl. 178—68 **5 Claims**



1. In a variable-speed data transmission system wherein a primary terminal transmits digital data messages to receiving terminals at one of a plurality of discrete digit-transmission speeds in a set of uniquely related speed, each said message containing a control character interspersed with other information signals, said character having a unique digital signal composition which is different at each said speed and distinguishable at each said speed from compositions of all other signals utilized in said system at any of said speeds, the improvement comprising

first means incorporated within a said receiving terminal for detecting said unique control character by detecting one of said unique signal compositions thereof, and second means for responding to said detected one of said unique signal compositions to set the digit-reception speed of said receiving terminal,

whereby said receiving terminal is automatically selfadjusted to recognize the speed at which the digits of said data messages are being transmitted and thereby adjusted to intelligibly receive said digits.

4,001,505

SPEECH SIGNAL PRESENCE DETECTOR

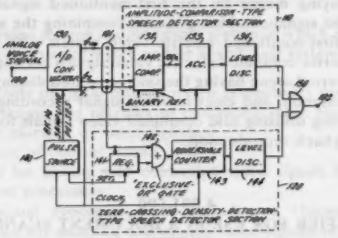
Takashi Araseki, and Kazuo Ochiai, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 3, 1975, Ser. No. 564,644

Claims priority, application Japan, Apr. 8, 1974, 49-39723

Int. Cl.² G10L *1/04*

U.S. Cl. 179—1 SC **9 Claims**



1. A speech detector adapted to detect a speech signal on a telecommunication channel, comprising:

input means for receiving an input digital speech signal supplied in the form of successive parallel codes having a repetition rate determined by the sampling frequency for said speech signal, each of said parallel codes comprising a sign bit indicating the polarity of a coded amplitude of the speech signal and a plurality of bits representing the magnitude of the sampled analog signal;

a first speech detector section coupled to said input means for detecting the presence of said speech signal depending on the comparison of the parallel-code-represented analog value with a threshold code representing predetermined analog level;

a second speech detector section coupled to said input means in parallel with said first speech section for detecting the presence of said speech signal depending on the occurrence of a change in at least one of said sign bits and the direction in which the parallel-code-represented analogue value varies; and

an OR circuit coupled to both said first and second speech detector sections for leading their outputs to an output terminal as a voice detection output; wherein said second speech detector section comprises first means coupled with said input means for deriving at least one of said sign bit changes and direction changes in the parallel-code-represented analog value to deliver a first binary output, second means coupled with said first means responsive to said first binary output to deliver a second binary output every time said first binary output has two successive different binary digits, third means for accumulating said second binary output, and fourth means coupled with said third means for delivering a third binary output every time the accumulated value at said third means exceeds a first threshold value, and wherein the output of said first speech detector section and said third binary output led through said OR circuit serves as said voice detection output.

4,001,506

HOME INTERCOM TELEPHONE SET

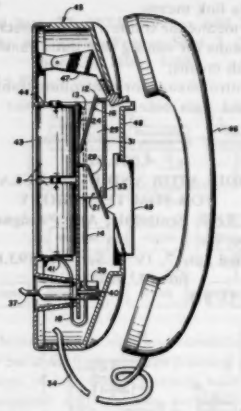
Horst Brandstatter, Vestner Str. 7, Zirndorf, Germany

Continuation of Ser. No. 509,540, Sept. 26, 1974, Pat. No. 3,924,073. This application Oct. 8, 1975, Ser. No. 620,595

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.² H04M *1/02, 1/08*

U.S. Cl. 179—1 H **1 Claim**



1. A telephone for use in an intercom system having a similar second telephone, the telephone comprising:

a prefabricated unit comprising a supporting plate having attached thereto electrical connecting lines including dimensionally stable wire stirrups forming a first, second and third pair of contact pins;

a case enclosing said electrical connecting lines and detachably secured to said supporting plate;

a ringing unit electrically connected to said electrical connecting lines;

a receiver having assembled therein a speaking unit comprising a microphone and a loudspeaker electrically connected to said electrical connecting lines,

wherein said receiver is removably held by said case; means for connecting a current source to said electrical connecting lines;

means for electrically connecting the second telephone to said electrical connecting lines;

an electrically conductive selector device selectively movable into and out of contact with said first pair of contact pins to establish or break electrical connection therebetween, wherein said selector device comprises a first spring element normally biased out of contact with said first pair of contact pins;

a ringing key for energizing the ringing unit of the second telephone when said ringing key is actuated, wherein said ringing key cooperates with said selector device to move said selector device against its normal spring bias and into contact with said first pair of contact pins when said ringing key is actuated;

an electrically conductive switching device selectively movable into contact with said second and third pairs of contact pins to selectively establish electrical connection between contact pins of each said pair, wherein said switching device comprises a second spring element normally biased into contact with said third pair of contact pins; and

a reversing key having a first position for connecting said ringing unit into an electrical circuit including the selector device of the second telephone and a second position for connecting said speaking unit into an electrical circuit including the speaking unit of the second telephone when its reversing key is in the second position and for connecting said selector device into an electrical circuit including the ringing unit of the second telephone when its reversing key is in its first position, wherein said switching device and said receiver cooperate with said reversing key to move said reversing key into its first position when said receiver is held by said case and establish electrical connection between said second pair of contact pins by moving said switching device against its normal bias and to move said reversing key into its second position when said receiver is removed from said case and establish electrical connection between said third pair of contact pins by permitting said switching device to move according to its normal bias.

4,001,507

METHOD AND APPARATUS FOR TELEPHONE SYSTEMS FOR FACILITATING DATA TRAFFIC BETWEEN THE SUBSCRIBER STATIONS AND A CENTRAL DATA PROCESSOR

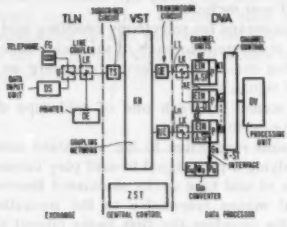
Franz Bonk, and Wolfgang Burger, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 277,510, Aug. 3, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,497

Claims priority, application Germany, Aug. 6, 1971, 2139546

Int. Cl.² H04M *1/06*

U.S. Cl. 179—2 DP **4 Claims**



1. In apparatus for telephone systems interoperating with a data processor wherein data communication takes place between individual telephone subscriber stations having both telephone sets and printers and said data processor, said data being available upon demand at said data processor both in audio form and a form suitable for control of said printer, the improvement comprising:

a plurality of subscriber line means connected, respectively, to each said subscriber station, and to both the telephone set and the printer thereat, and to a single output channel of said data processor and

means for transmitting said data in said form suitable for controlling said printer following transmission of the same data in audio form.

4,001,508

MESSAGE COMMUNICATION SYSTEM FOR TELEPHONE LINES

Richard C. Johnson, Dayton, Ohio, assignor to Communications International Corporation, Dayton, Ohio

Filed Sept. 17, 1975, Ser. No. 614,203

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 D **11 Claims**

1. A communications system adapted for delivering prerecorded messages over a plurality of telephone lines, comprising:

A. a corresponding plurality of tape decks, each of said tape decks having:

i. a play control input;

ii. a first playback transducer for providing a first audio output signal; and

iii. a second playback transducer for providing a second control output signal;

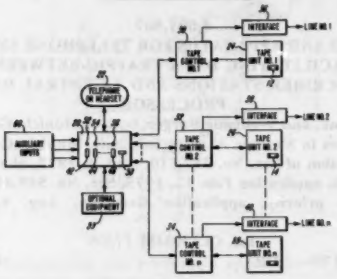
B. a prerecorded tape for each of said tape decks, each said tape having recorded thereon;

i. at least one message on a first track thereof; and

ii. a first control signal recorded as a first predetermined frequency tone burst on a second track thereof, said first control signal occurring after the completion of said message;

said first and second transducers being adapted to sense the audio and control signals recorded, respectively, on said first and second tracks;

C. a telephone calling instrument;



D. a control unit including:

i. selection means for selectively coupling said telephone calling instrument to each of said telephone lines; and

ii. signaling means for selectively issuing an operation control signal; and

E. control means for each one of said tape decks, said control means including:

i. first means responsive to the operation control signal for applying a play signal to said play control input of the one of said tape decks associated therewith; and

ii. second means responsive to the operation control signal for coupling the first audio output signal from said one tape deck to its corresponding telephone line.

4,001,509

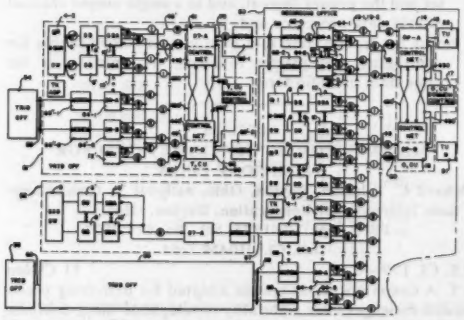
REMOTE OFFICE MESSAGE METERING SYSTEM

John C. McDonald, Los Altos; Gary C. Henrickson, Palo Alto; Alan K. Taylor, and William A. Settle, both of San Jose, all of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Jan. 30, 1975, Ser. No. 545,489

Int. Cl.² H04M *15/12*

U.S. Cl. 179—7.1 R 25 Claims



1. A message metering apparatus for metering the usage of a telephone system by a plurality of subscriber units and for transmitting data indicating usage between a first office and a remote second office comprising,

in a first office,

means for generating signals to provide data indicating usage of the telephone system by each of said subscriber units,

memory means for storing said data,

data link means for transferring said data from said first office to a second office,

first control means for controlling transfer of said data from said memory means over said data link means,

in a second office,

data receiver means for storing said data transferred over said data link means,

data path means for tranferring said data,

storage means for storing said data transferred over said data path means,

second control means for controlling transfer of said data from said data receiver means over said data path means.

4,001,510

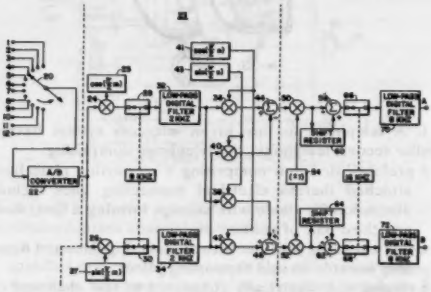
DIGITAL MODULATOR AND DEMODULATOR SYSTEM FOR FDM TELEPHONY

Francis Keith Reed, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed July 7, 1975, Ser. No. 593,892

Int. Cl.² H04J *1/04*

U.S. Cl. 179—15 FD 15 Claims



1. A communications system for multiplexing and demultiplexing a plurality of space division channel signals comprising:

modulating means having an output signal, further comprising,

means for sampling the plurality of space division channel signals to sequentially supply samples of said channel signals;

first means for digitizing said sequential samples of said channel signals;

first means for converting said digitized samples of said channel signals to frequency division multiplex signals according to a predetermined mathematical algorithm utilizing sine and cosine function multipliers having only values of −1, 0 and +1;

second means for converting said frequency division multiplex signals to analog signals;

first means for frequency converting said analog signals to a higher predetermined output signal frequency range;

demodulating means, further comprising;

means for receiving and frequency converting said signals of higher frequency range to a predetermined lower frequency range;

second means for digitizing said signals of lower frequency range;

third means for converting said digitized lower frequency signals into a plurality of of digitized space division channel signals according to a predetermined mathematical algorithm utilizing sine and cosine function multipliers having only values of −1, 0 and +1;

fourth means for converting said digitized space division channel signals to analog signals, and

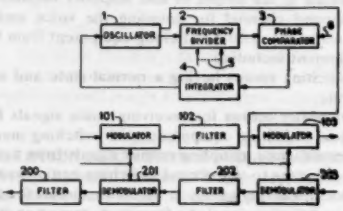
transmitting means for communicating said modulating means output signal to said demodulating means.

4,001,511

CHANNEL BOARD FOR TELEPHONY TRANSMISSION EQUIPMENT USING SINGLE SIDE BAND MULTIPLEXING

Claude Buchholtzer; Pierre Deman; Michel Drobecq, and Pierre Oger, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 27, 1975, Ser. No. 608,241
Claims priority, application France, Sept. 3, 1974, 74.29954
Int. Cl.² H04J *1/08*
U.S. Cl. 179—15 FS **11 Claims**



1. A channel board for a telephony transmission equipment using single side band multiplexing for forming groups, including primary groups, of telephone channels, said channel board comprising a support and on this support: a modulating branch for frequency translating a voice frequency channel and a demodulating branch for translating again to voice frequency a previously frequency translated telephone channel, said modulating branch including in series a premodulation modulator, a filter, and a second modulator, said demodulating branch including in series an input demodulator, a filter and a further demodulator; and a frequency generator for selectively delivering at least all the carrier currents necessary for translating a premodulated telephone channel into any desired position in a primary group, said frequency generator being of the phase locked loop type, including an oscillator having a control input and a circuit having an input coupled for receiving the wave generated by said oscillator and an output connected to said control input of said oscillator, said circuit including a variable frequency divider for dividing the frequency of said wave, said frequency divider having control inputs for controlling the value N of the divisor of the division effected by said frequency divider and an output, and a phase comparator having a first input coupled to the output of said frequency divider and a second input for receiving a reference frequency, for comparing the phases of the output signal from said frequency divider and of said reference frequency; said premodulation modulator and said further demodulator having respective carrier inputs for receiving a signal at a fixed frequency, said second modulator and input demodulator having respective carrier inputs coupled for receiving said wave.

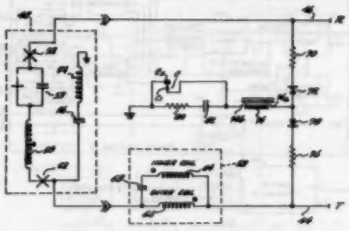
4,001,512

AUTOMATIC TELEPHONE NUMBER IDENTIFICATION CIRCUIT

Darryl F. Proctor, Redmond, and Peter T. Skelly, Issaquah, both of Wash., assignors to Proctor & Associates Company, Redmond, Wash.

Filed July 16, 1975, Ser. No. 596,397
Int. Cl.² H04M *15/36*
U.S. Cl. 179—17 A **24 Claims**

1. An identification circuit for use with automatic number identification apparatus in a communication system which includes a central office and a plurality of remote stations, each of said remote stations being connected to said central office by a communication line pair, at least one communication line pair in said communication system being common to first and second remote stations, said one communication line pair being split at a point along the length thereof into first and second branches, said first branch being connected to said first remote station, said first branch, said first remote station and said one communication line pair forming a first communication line loop, said second branch being connected to said second remote station, said second branch, said second remote station and said one communication line pair forming a second communication line loop, said identification circuit comprising:



signal sensing means for detecting the presence of a dc loop current in said second communication line loop, and providing an output in response thereto;

circuit means operative to cause a signal imbalance on said one communication line pair when said circuit means is connected to said second communication line loop; and,

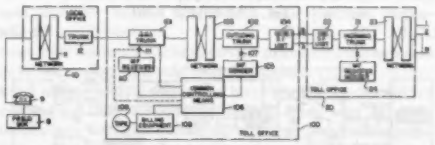
means responsive to said output from said signal sensing means for connecting said circuit means to said second communication line loop.

4,001,513

METHOD AND APPARATUS FOR THE DETECTION OF FRAUDULENT TOLL TELEPHONE CALLS

David Charles Naylor, Georgetown, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed July 31, 1975, Ser. No. 600,649
Int. Cl.² H04M *15/12*
U.S. Cl. 179—18 DA **11 Claims**



1. In a telephone system comprising an originating office, and a destination office connected to said originating office via a transmission path, said originating office comprising a toll call processing system and an automatic message accounting system including at least one automatic message accounting trunk circuit connected to said call processing system, and wherein control signalling between said offices comprises using the predetermined presence or absence of a single frequency signal on said transmission path including a proceed-to-send signal transmitted from said destination office to said originating office, a method of detecting a fraudulent toll telephone call comprising the step of detecting a supervisory signal at the automatic message accounting trunk circuit, said supervisory signal corresponding to a second proceed-to-send signal from the destination office.

4,001,514

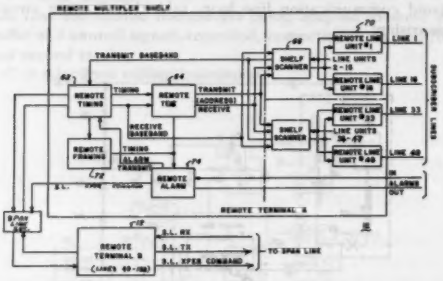
SUBSCRIBER DIGITAL MULTIPLEXING SYSTEM WITH TIME DIVISION CONCENTRATION

Walter Kenneth Wurst, Guelph, Canada, assignor to ITT Canada, Limited, Toronto, Canada

Filed Dec. 9, 1974, Ser. No. 530,954

Int. Cl.² H04M *7/14*

U.S. Cl. 179—18 FC **10 Claims**



9. A time division concentrator for switching a plurality of lines through respective channels of a bi-directional multiplexer from a central office to subsidiary remote offices, including in said central office a channel memory having a position permanently associated with each channel for temporarily storing in each position the address of a line transmitting or receiving on said channel, a line status memory comprising a plurality of positions each permanently associated with a line for storing an indication of the status of the associated line, means for scanning said line status memory in a receive information mode, to complete a status scan cycle of the lines of the concentrator, a last-look line memory with a position for each line to temporarily store respective indications of the results of the last scan of the memory, means responsive to completion of a scan of said line and line status memories for transferring said line status and last-look memories to a transmit mode to initiate a second scan of said memories, comparing the scanned status in said status memory with a last-look line status memory for initiating a demand for a channel on a difference found in said comparison.

4,001,515

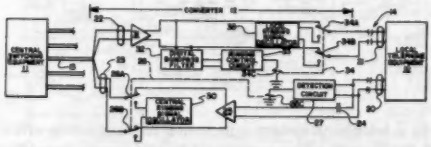
INTERFACING UNIT FOR TELEPHONE NETWORKS

Plato Zorzy, Marblehead, Mass., assignor to Astreon Corporation, Lowell, Mass.

Filed Nov. 21, 1974, Ser. No. 525,755

Int. Cl.² H04M *1/00*

U.S. Cl. 179—18 HB **10 Claims**



1. An interface unit for coupling voice and ringing signals between local telephone equipment and central switching equipment wherein the frequency of the ringing signals transmitted and received by the central switching equipment differs from the frequency of the ringing signals transmitted and received by the local telephone equipment, said interface comprising:

A. a first channel for coupling the voice and ringing signals from the central switching equipment to the local equipment, said first channel including:

i. switching means having a normal state and an active state,

ii. amplifier means for receiving voice and ringing signals from the central switching equipment, said switching means, in a normal state, coupling the output signals from said amplifier means to the local telephone equipment.

iii. a local ringing signal oscillator circuit for transmitting a ringing signal at the same frequency as the local telephone ringing signal frequency, said switching means, in an active state, coupling output signals from said local ringing signal oscillator circuit to the local telephone equipment, and

iv. means including a digital bandpass filter for

iv. discriminating ringing signals from the central switching equipment thereby to shift said switching means to the active state, said discriminating means being connected to the output of said amplifier means, and

B. a second channel for coupling the voice and ringing signals to the central switching equipment from the local equipment including

i. switching means having a normal state and an active state,

ii. amplifier means for receiving voice signals from the local switching equipment, said switching means, in a normal state, coupling output signals from said amplifier means to the central switching equipment,

iii. a central ringing signal oscillator circuit for transmitting a ringing signal at a frequency corresponding to the central switching equipment ringing signal frequency, said switching means, in an active state, coupling output signals from said central ringing signal oscillator circuit to the central switching equipment, and

iv. detecting means for shifting said switching means to an active state in response to the receipt of a ringing signal from the local telephone equipment.

4,001,516

APPARATUS FOR FEEDING AND CONTROLLING RINGING CURRENTS IN TELECOMMUNICATION SYSTEMS

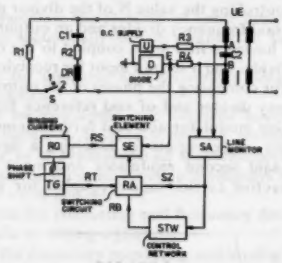
Günther Weisigk, Zurich; Karlheinz Schmah, Adliswil, and Harald Berger, Zurich, all of Switzerland, assignors to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Filed Aug. 21, 1975, Ser. No. 606,385

Claims priority, application Switzerland, Sept. 24, 1974, 12916/74

Int. Cl.² H04M *3/02*

U.S. Cl. 179—84 R **35 Claims**



1. In apparatus for feeding ringing currents from a ringing current supply (RQ) to line circuits, and for controlling ringing currents in said line circuits, in telephone and other telecommunication systems having an exchange equipped with a source of supply voltage (U), and having subscriber circuits equipped with a ringing circuit capacitor (C1), the improvement comprising in combination:

means including a junction (E) for feeding ringing currents to line circuits;

means connected between said feeding function (E) and a pole of the source of supply voltage (U) for preventing short-circuiting of ringing currents;

an electronic switching device (SE) including semiconductive means for discharging said ringing circuit capacitor (C1) and semiconductive switching means having a control electrode and being connected between the ringing current supply (RQ) and the feeding junction (E); and

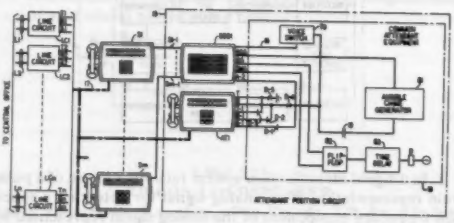
means (RA) connected to the control electrode of the switching device (SE) for causing the switching device (SE) to switch ringing currents on the off instantly and to discharge said ringing circuit capacitor (C1).

4,001,517

DIRECT STATION SELECTION HOLD ARRANGEMENT

Richard Henry Bidlack, Boonton; Wayne Jay Egan, Eatontown, and Steven Gary Miller, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 3, 1975, Ser. No. 628,076
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—99 **13 Claims**



1. In a key telephone system, a direct station selection arrangement comprising:

a plurality of key telephone station sets;

at least one attendant position circuit, wherein said attendant position circuit comprises:

a communication handset,

a plurality of dedicated communication paths corresponding on a one-to-one basis to each of said plurality of key telephone station sets for connecting said attendant position circuit to said key telephone station sets,

a plurality of direct station selection key means connected on a one-to-one basis to each of said plurality of dedicated communication paths,

wherein each said key telephone station set has associated therewith:

a loudspeaker,

means for amplifying voice signals appearing on said dedicated communication path corresponding to said key telephone station set,

means for applying said amplified signals to said loudspeaker; and

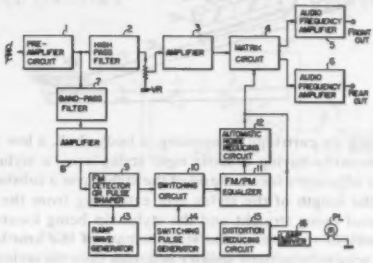
wherein each of said direct station selection key means is operable for establishing a communication path from said attendant communication handset through said direct station selection key means and via said corresponding dedicated communication path to the key telephone station set corresponding to said direct station selection key means such that any voice signal generated at said communication handset is applied to said loudspeaker at said key telephone station set.

4,001,518

DISCRETE FOUR-CHANNEL DISC REPRODUCING SYSTEM

Yukio Sugimoto, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1975, Ser. No. 556,875
Claims priority, application Japan, Mar. 12, 1974, 49-28709; Mar. 28, 1974, 49-35333; Apr. 10, 1974, 49-41269; Apr. 10, 1974, 49-41270
Int. Cl.[2] G11B *3/00, 3/78*
U.S. Cl. 179—100.4 ST **7 Claims**



1. A four-channel stereophonic reproducing system for reproducing a CD-4 type four-channel record wherein a composite signal obtained from a first main channel signal constituted by a sum combination of first and second audio signals and a first subchannel signal constituted by a frequency or phase modulation of a difference combination of said first and second audio signals on a predetermined sub-carrier is recorded in one sound groove, and also wherein another composite signal obtained from a second main channel signal constituted by a sum combination of third and fourth audio signals and a second sub-channel signal constituted by a frequency or phase modulation of a difference combination of said third and fourth audio signals on a predetermined subcarrier is recorded on another sound groove, said system comprising:

means for reproducing a main channel signal and a subchannel signal having a sub-carrier from each of said first and second composite signals recorded on said four-channel record;

detector means for detecting said sub-channel signals reproduced by said reproducing means;

matrix means for matrixing said main channel signals reproduced by said reproducing means and output signal from said detector means to produce four discrete stereophonic audio signals;

a noise elimination switching circuit provided between said detector means and said matrix means;

control means including a ramp wave generating circuit for converting the sub-channel signals from said detector means into triangular wave signals, and a switching pulse generating circuit responsive to the output of said ramp wave generating circuit for generating a switch pulse of a pulse width corresponding to an interval when a dropout of sub-carriers appears in said detected sub-channel signals, said control means on-off controlling said noise elimination switching circuit by the output of said switching pulse generating circuit to prevent application of the output of said detector means to said matrix means during the appearance of sub-carrier dropout; and

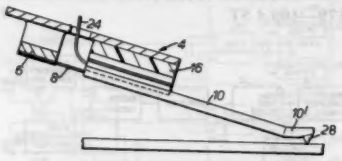
distortion reducing means including a time constant circuit, said distortion reducing means being responsive to the output of said control means for attenuating an entire frequency band or at least a high frequency band of the output of said noise elimination switching circuit for a time period determined by the time constant circuit which is longer than the period of appearance of the sub-carrier dropout.

4,001,519

PICK-UP CARTRIDGES FOR GRAMOPHONE RECORDS

Alexander R. Rangabe, 'Stoneacre', Denmead, Portsmouth, Hampshire, England

Filed Nov. 22, 1974, Ser. No. 526,237
Claims priority, application United Kingdom, Nov. 23, 1973, 54415/73
Int. Cl.² H04R 19/06, 9/12
U.S. Cl. 179—100.41 G 13 Claims



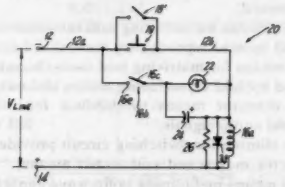
1. A pick-up cartridge comprising, a body shell, a low mass stylus assembly having a short rigid stylus arm, a stylus tip mounted adjacent a forward end of the stylus arm a substantial part of the length of the stylus arm extending from the rear end thereof being straight and the stylus tip being located in the vicinity of the axis of the straight part of the arm and a resilient wire substantially shorter in length than the stylus arm fixedly attached at its forward end to the stylus arm so as freely to support the stylus arm and having at least a major portion thereof in alignment with the stylus arm, a mounting member provided on the body shell and supporting the rear end of the resilient wire with the stylus assembly inclined forwardly away from the body shell, and transducer means responsive to movement of the stylus arm mounted in the body shell at a location so as to be wholly between the stylus tip and the resilient wire.

4,001,520

HOLD CIRCUIT FOR TELEPHONES

Herbert H. Waldman, 1739 52nd St., Brooklyn, N.Y. 11204, and Kalju Meri, 60-67 70th St., Maspeth, N.Y. 11378

Filed Feb. 20, 1975, Ser. No. 551,285
Int. Cl.² H04M 1/00
U.S. Cl. 179—81 R 18 Claims



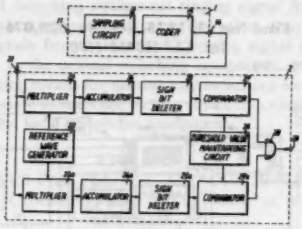
1. A hold circuit for at least one pair of telephone lines connected to at least one telephone instrument, the telephone lines requiring a predetermined current flow therethrough to "hold" and seize the same, and exhibiting a higher voltage when all handsets of all associated telephone instruments connected to the pair of telephone lines are "on hook" and a lower voltage when a handset of any of the associated telephone instruments is "off hook," where said higher and lower telephone line voltages may vary in magnitude, the hold circuit comprising a pair of terminals adapted to be connected to a pair of telephone lines; latching means connected to said terminals for inhibiting said predetermined current flow through the hold circuit in a first mode and for permitting at least said predetermined current to flow through the hold circuit in a second mode; manually actuable switching means connected to said latching means for actuating the latter into said second mode when said switching means is manually actuated to thereby cause the hold circuit to seize the telephone lines and said latching means reverting to its said first mode when a handset of any of the associated telephone instruments is subsequently rendered "off hook," where the hold circuit automatically releases its seizure of the telephone lines, load means consisting of at least visual indicator means, a capacitor connected in parallel with said load means, the latter parallel combination being connected in series with said latching means, said load means being effective to insure that a voltage developed across said capacitor causes said latching means to become deenergized and resultant release of the telephone lines by the hold circuit upon subsequently removing any associated telephone handset "off the hook."

4,001,521

SIGNAL IDENTIFICATION SYSTEM

Yasuo Fukata, Mitaka, and Ryoichi Hatsumi, Nagareyama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed May 14, 1975, Ser. No. 577,155
Claims priority, application Japan, May 17, 1974, 49-55050
Int. Cl.² H04M 1/50
U.S. Cl. 179—84 VF 4 Claims



1. In a signal identification system receptive in use of a pulse train representative of an analog signal for detecting a specified frequency component of the analog signal represented by the input pulse train, the improvement of the system comprising:

input terminal means receptive of an input pulse train representative of an analog signal;

pulse generation means for generating two reference wave pulse trains each periodic at a specified frequency of a frequency component of the analog signal but displaced in phase by $\pi/2$ from each other;

two multipliers each connected to said input terminal means and said pulse generation means for receiving and multiplying said input pulse train by said two reference wave pulse trains to each develop an output signal equal to the product of the respective received signals;

two accumulators each connected to a respective one of said two multipliers for accumulating a respective one of the output signals developed by said two multipliers;

threshold means controllable for producing an output signal representative of a certain threshold value;

two comparators each connected to a respective one of said accumulators and both connected to said threshold means for developing an output to identify the presence of said analog signal component of the specified frequency when the absolute value of at least one of the accumulated values exceeds said threshold value; and

threshold value control means connected to said input terminal means and said threshold means for controlling the threshold value represented by the output signal of said threshold means in accordance with an average DC level of the input pulse train for rendering the outputs developed by said comparators independent of amplitude variations of the input pulse train.

4,001,522

RIBBON TYPE LOUDSPEAKER

Alexei Fedoseevich Kasatkin, ulitsa Pravdy, 7/9, kv. 42; Jury Vasilievich Smirnov, ulitsa Alabyana, 11, kv. 44, and Ilya Afanasievich Feldman, ulitsa Dubininskaya, 6, korpus 1, kv. 269, all of Moscow, U.S.S.R.

Filed Jan. 5, 1976, Ser. No. 646,417

Claims priority, application U.S.S.R., Jan. 14, 1975, 2090005

Int. Cl.² H04R 9/02

U.S. Cl. 179—115 V 1 Claim

1. A ribbon type loudspeaker comprising:

a. permanent magnets defining a magnetic system; a working gap between pole pieces of said permanent magnets;

b. at least one sound reproducing ribbon extending in the working gap between the pole pieces of said permanent magnets; and a dielectric backing of said sound reproducing ribbon, conductive strips of said sound reproducing ribbon applied onto said dielectric backing parallel with one another, with spaces left therebetween, longitudinally of said sound reproducing ribbon.

4,001,523

RIBBON LOUDSPEAKER

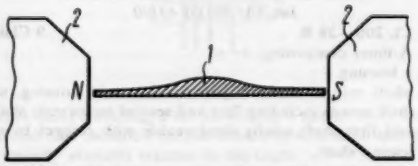
Alexei Fedoseevich Kasatkin, ulitsa Pravdy, 7/9, kv. 42; Jury Vasilievich Smirnov, ulitsa Alabiana, 11, kv. 44, and Ilya Afanasievich Feldman, ulitsa Dubininskaya, 6 korpus 1, kv. 269, all of Moscow, U.S.S.R.

Filed Jan. 5, 1976, Ser. No. 646,545

Claims priority, application U.S.S.R., Jan. 14, 1975, 2090005

Int. Cl.² H04R 9/02

U.S. Cl. 179—115 V 1 Claim



1. A ribbon type loudspeaker comprising:

a. permanent magnets defining a magnetic system, a working gap being defined between pole faces of said permanent magnets; and

b. at least one ribbon for sound reproduction having an electrically conductive portion received in said working gap between the pole faces of said permanent magnets, said electrically conductive portion having its thickness increasing from the edges of said sound reproducing ribbon, disposed adjacent to the pole faces of said permanent magnets, toward a maximum at the central portion of said sound reproducing ribbon.

4,001,524

APPARATUS FOR TRANSMITTING AND RECEIVING PULSES

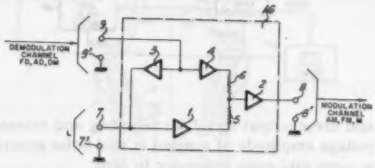
Lucien Pierre Emile Prudhon, Soisy, Seine, and Jean Pierre Georges Charil, Clamart, both of France, assignors to Association des Ouvriers en Instruments de Precision, Paris, France

Continuation of Ser. No. 319,168, Dec. 28, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,575

Claims priority, application France, Jan. 4, 1972, 72.00102; Dec. 8, 1972, 72.43763

Int. Cl.² H04B 1/58

U.S. Cl. 179—170 T 23 Claims



1. In a PCM telecommunication system, in combination;

a subscriber line provided with a first terminal;

a modulation channel for signals originating at said subscriber line, said modulation channel being provided with a second terminal;

a demodulation channel for signals to be transmitted to said subscriber line, said demodulation channel being provided with a third terminal;

duplexing means for coupling said channels to said subscriber line while decoupling said channels from each other, said duplexing means comprising a resistance network forming an incoming-signal path from said third terminal to said first terminal, an outgoing-signal path from said first terminal to said second terminal, and a balancing-signal path from said third terminal to said second terminal for cancelling the transmission of signals from said demodulation channel to said modulation channel via said incoming-signal and outgoing-signal paths in series; and

signal-amplifying means including at least one amplifier inserted between said third terminal and said network for preventing the transmission of signals from said first terminal to said third terminal via said incoming-signal path.

4,001,525

ARRANGEMENT FOR TESTING TELECOMMUNICATION REPEATERS

Allan Kendrick Edwards, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,507

Claims priority, application United Kingdom, Dec. 3, 1974, 52248/74

Int. Cl.² H04B 1/60

U.S. Cl. 179—175.31 R 18 Claims

1. An arrangement for in-line testing of a telecommunication repeater of the digital regenerator type comprising:

a transmission line for transmitting a digital signal;

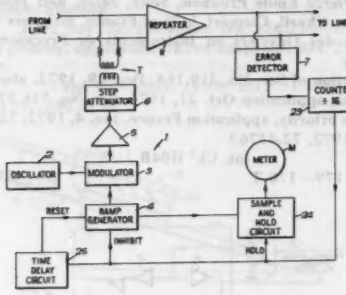
a repeater under test coupled into said transmission line to regenerate said digital signal;

a noise generator to generate a noise signal of steadily increasing amplitude;

an impedance transformer coupled to said noise generator and the input of said repeater to superimpose said noise signal on said digital signal;

an error detector coupled to the output of said repeater to produce an error output signal when the amplitude of said noise signal has increased until errors are produced in said digital signal at the output of said repeater; and

first means coupled to the output of said error detector and said noise generator, said first means being responsive to



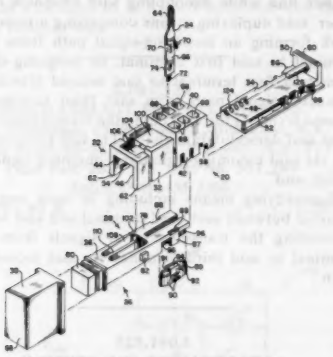
said error output signal for sampling and measuring the voltage amplitude of a signal in said noise generator and to reset said noise generator to zero.

4,001,526

ALTERNATE ACTION SWITCH

Harry W. Olson, Woodridge, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed July 12, 1974, Ser. No. 487,977
Int. Cl.² H01H *15/24*
U.S. Cl. 200—16 D **3 Claims**



1. A switch assembly comprising in combination:

a housing including a main housing member and a housing cover, said main housing member defining an elongated cavity having open ends and an open side wall, said housing cover being engageable with said main housing member for closing said open side and the second of said open ends;

an actuator mounted for sliding movement along said cavity between alternate positions and insertable into said cavity through said open side, said actuator having an operating portion extending from said cavity through a first of said open ends for manual operation of said actuator, said actuator including a plurality of contact recesses formed therein;

a plurality of switch contacts mounted in said contact recesses, said switch contacts including loop portions disposed in said contact recesses and a latch arm extending from said loop portion and engageable with said actuator;

spring means in said cavity for biasing said actuator;

an indexing mechanism defined on said actuator and on said housing for releasably retaining said actuator in said alternate positions; and

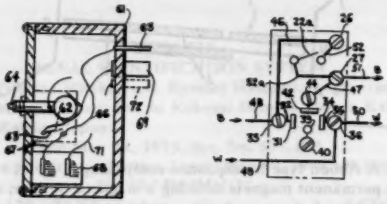
a plurality of terminals insertable into said cavity through said housing for engagement by said switch contacts.

4,001,527

ELECTRICAL TIMER-SWITCH

Stephen Joseph Hulshizer, 14 Cedar Hill Road, Hatfield, Pa. 19440

Continuation-in-part of Ser. No. 475,741, June 3, 1974, abandoned, which is a division of Ser. No. 337,831, March 5, 1973, Pat. No. 3,828,224. This application June 13, 1975, Ser. No. 586,732
Int. Cl.² H01H *43/00, 9/00*
U.S. Cl. 200—38 FB **8 Claims**



1. A timer-switch comprising an enclosing casing; an electrical switch supported therein having two electric switch contacts and a movable electricity conducting element for electrically connecting and disconnecting said switch contacts; a clock motor also supported within the casing; mechanical connecting means from the clock motor to said movable conducting element to operate it at a predetermined interval and thereby electrically connect and disconnect said switch contacts; a first prong and a second prong supported by the casing and constituting a pair of conventionally disposed prongs projecting from the casing for entry in a conventional wall electrical outlet; a third prong supported by the casing and projecting in an unconventional position outside of said pair of prongs, a wire connecting said third prong to one of said switch contacts and another wire connecting the other switch contact to said first prong, whereby closure of said switch by said movable element electrically connects said third prong to said first prong.

4,001,528

TIMING MECHANISM

Kenneth E. Deane, Beech Grove; Thomas F. Ring, and Bernard Malott, both of Indianapolis, all of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Mar. 21, 1975, Ser. No. 560,986
Int. Cl.² H01H *43/00*
U.S. Cl. 200—38 R **9 Claims**

1. A timer comprising:

a. a housing,

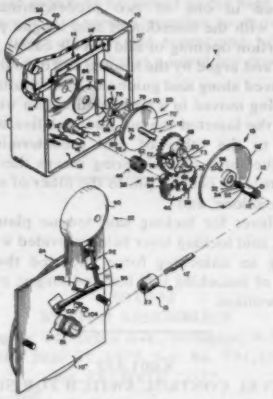
b. shaft means rotatably journalled in said housing, said shaft means including first and second concentric shafts, said first shaft axially displaceable with respect to said second shaft,

c. constant speed motor drive means carried by said housing and coupling means coupling said motor drive means to said second shaft said coupling means including cooperating noncircular gear means one of which is fixedly carried by said second shaft, the other fixedly carried by an output shaft of said constant speed motor drive means,

d. a first switch means carried by said housing,

e. switch opening and closing means axially displaceable in a first direction in response to an axial displacement of said first shaft so as to open or close said first switch means, and actuator means responsive to the rotation of said second shaft to axially displace said switch opening and closing means in an opposite direction in a programmed sequence so as to open or close said first switch

means in accordance with said programmed sequence, and



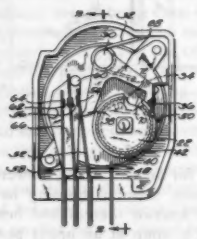
f. cam means carried by said second shaft and second switch means carried by said housing opening and closing in response to rotation of said cam means.

4,001,529

PERCENTAGE TIMER

Joseph J. Mahon, Libertyville, Ill., assignor to The Singer Company, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,303
Int. Cl.² H01H *7/08, 43/10*
U.S. Cl. 200—39 R **10 Claims**



1. A timer including a motor driving a shaft,
a disc cam mounted on and driven by said shaft and being axially movable relative to the shaft,
means biasing the cam to a first position,
a lever including a cam follower biased into engagement with the perimeter of the cam when the cam is in said first position,
means for moving the cam axially on said shaft to a second position in which position the cam moves out from under said follower and the lever moves inwardly of the cam along a face of the cam and engagement of the follower with said face prevents return of the cam to said first position under influence of the cam biasing means,
a switch actuated by said lever when the follower moves inwardly,
and means for returning the follower to the perimeter of said cam and the cam to said first position.

4,001,530

ICE BREAKING DEVICE FOR DISCONNECT SWITCH CONTACT ASSEMBLIES

Calvin E. Redfern, Portland, Oreg., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 11, 1975, Ser. No. 639,809
Int. Cl.² H01H *31/00*
U.S. Cl. 200—48 A **9 Claims**

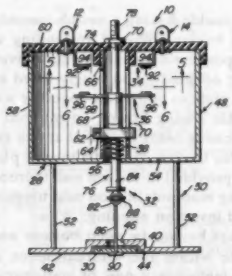
1. In a disconnect switch having a contact blade arm movable between an open and a closed position, the contact blade arm including a contact portion,
a contact assembly having a pair of contact sets arranged in spaced apart relationship to receive the contact portion of said blade arm therebetween,
mechanical ice removing means carried by at least one of said contact sets to remove ice from the associated contact set prior to said contact portion of said blade arm entering into contact engagement with said contact sets, and
operating means actuated by the said contact blade arm to operate said ice mechanical removing means.

4,001,531

WATER ALARM SWITCH

James R. Crockett, Sr., 3327 Zuni Circle, Las Vegas, Nev. 89109

Filed May 22, 1975, Ser. No. 579,891
Int. Cl.² H01H *29/00*
U.S. Cl. 200—61.04 **7 Claims**



1. A water responsive switch, comprising, in combination:
a. a support frame;
b. a water-soluble element arranged abutting the frame;
c. a member anchored on the water-soluble element and arranged biasing the element against the frame;
d. two electrical contact means, with one of the contact means, being affixed to the frame and the other of the contact means affixed to the member, the member being arranged extending toward the one of the contact means, both of the contact means including a pair of spaced points, the points of one of the contact means matched with the points of the other of the contact means for mating engagement by the points when the switch is in its

closed mode, and lugs connected to the points of the one of the contact means for connecting the one of the contact means into an external electrical alarm circuit, a contactor blade affixed to the member with the points of the other of the contact means being mounted on the blade and electrically connected together for bridging the points of the one of the contact means when the switch is in its closed mode; and

e. resilient means engaging the member and the frame for biasing the member toward the one of the contact means and bringing the other of the contact means into contact means into contact with the one of the contact means whenever the water-soluble element is loosened and releases the member, the member being arranged for movement relative to the frame.

4,001,532

SEAT BELT BUCKLE SWITCH HAVING SLIDABLE ACTUATOR AND BRIDGING CONTACT WIRE

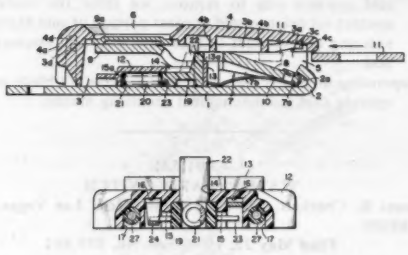
Tatsushi Kubota, and Akinori Fujiwara, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Aichi and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai, Aichi, both of, Japan

Filed June 20, 1975, Ser. No. 588,632

Claims priority, application Japan, June 21, 1974, 49-73597[U]

Int. Cl.² H01H *3/16, 1/36;* A44B *19/00*

U.S. Cl. 200—61.58 B **5 Claims**



1. A seat belt buckle having a switch assembly comprising:

a bottom plate having a pair of upstanding walls extending from the opposite sides thereof respectively;

a buckle cover adapted to be snugly fitted on and fixed to said bottom plate to constitute together with said bottom plate a buckle casing having an internal space therein, said buckle casing being provided at one end thereof with an opening for the insertion of a tongue plate, said buckle cover being provided in the top wall thereof with a slot for the unlocking manipulation on said tongue plate inserted through said insertion opening;

a switch bracket having an open bottom and fixed to said bottom plate within the internal space of said buckle casing, and including a pair of stationary contact strips secured to said switch bracket, and a longitudinal guide slot bored in the top wall of the switch bracket;

a slider mounted to said switch bracket to be slidable relative to said switch bracket in the longitudinal direction thereof and having a contact pin extending therethrough and protruding from the opposite side surfaces thereof in a direction substantially normal to the longitudinal axis thereof, an upstanding knob formed at the front end of said slider and projecting through the longitudinal guide slot bored in said switch bracket into an interference contact position with said tongue plate to be inserted and a longitudinal cut-out formed between a pair of side wall portions of the rear end of said slider;

a coiled compression spring means disposed between the inner end of said cut-out in said slider and the rear wall of said switch bracket for urging said slider normally to be maintained in one of two predetermined positions, whereby with the insertion of said tongue plate through said insertion opening of said buckle casing, said knob is engaged and urged by the leading end of said tongue plate to be moved along said guide slot and simultaneously said slider being moved in a parallel direction with the movement of the inserted tongue plate relative to said switch bracket to the other of said predetermined position against the force of said spring means thereby bringing said protruding contact pin to the other of said predetermined positions; and

a locking lever for locking said tongue plate in inserted position, said locking lever being provided with means for receiving an unlocking force imparted thereto for the purpose of unlocking said inserted tongue plate from the locked position.

4,001,533

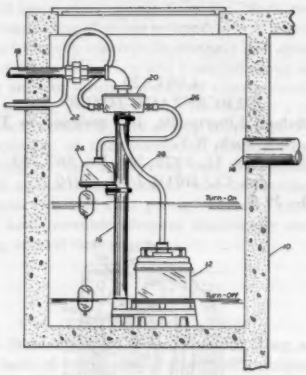
SEALED LEVEL CONTROL SWITCH FOR SUMP PUMPS

William James Conery, and Donald D. Smith, both of Ashland, Ohio, assignors to Robert M. Keener, Ashland; McNeil Corporation, Akron and George T. Buskirk, Hayesville, all of Ohio

Filed Jan. 20, 1975, Ser. No. 542,228

Int. Cl.² H01H *35/18*

U.S. Cl. 200—84 C **4 Claims**



1. In a control for an electrically powered sump pump, a sealed non-magnetic material housing having power leads connected to the interior thereof and being adapted to be positioned within a sump at an upper portion thereof, said housing having a downwardly open cup-shaped section and a base section extending across the open end of said cup-shaped section, and characterized by a normally open microswitch connected to said power leads to control current flow, said microswitch having a spring control arm extending therefrom for movement in a vertical plane and for closing said switch when said control arm is moved toward said switch, said housing having a downwardly facing tubular recess formed therein directly vertically below said control arm, said housing base section having a wall portion extending vertically upwardly to form said recess which is open at its lower end and closed at its upper end, a pair of cooperating permanent magnet and magnetic members the first of which is secured to said control arm and the second of which is positioned in said recess for controlled vertical movement therein, said magnet and magnetic members being positioned in adjacent but spaced vertical relation, a non-magnetic coil spring engaging the second of said members to urge it toward the upper end of said recess, a non-magnetic cable attached to said second member, and

displacement weight means attached to spaced portions of said cable to pull said second member downwardly and release the switch arm to open said switch under low water conditions and enable said switch to be closed under high water conditions that permit said second member to move to a point adjacent the upper end of said recess and have attraction between said members pull said control are downwardly.

4,001,534

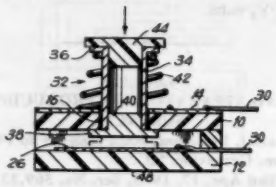
SWITCH ASSEMBLIES

James E. Temple, 24 Spruce Ave., Bethpage, N.Y. 11714

Filed June 27, 1975, Ser. No. 591,156

Int. Cl.² H01H *13/52*

U.S. Cl. 200—160 **11 Claims**



1. An electrical switch structure comprising a pair of electrically non-conductive sheets and an electrically non-conductive spacer means situated between and engaging said sheets to maintain them apart from each other with inner surfaces of said sheets respectively directed toward each other, one of said sheets being formed with an opening passing therethrough and said spacer means being clear of an inner surface region of said one sheet which surrounds said opening thereof as well as an inner surface region of the other sheet which is directed toward said opening of said one sheet, an elongated electrically conductive switch-operating means extending freely through said opening of said one sheet so as to be movable with respect to said one sheet and having inner and outer, electrically conductive enlarged head ends larger than said opening and respectively situated at opposite sides of said one sheet, and said inner electrically conductive enlarged head end being situated between said sheets, said inner head end having a thickness smaller than the space between said sheets so as to be movable in said space between said sheets, electrically conductive spring means surrounding said elongated switch-operating means and extending between said one sheet and said outer enlarged head end of said switch-operating means for urging said inner enlarged head end thereof toward said inner surface region of said one sheet which surrounds said opening thereof, and a pair of electrically conductive coatings forming part of an electrical circuit, one of said coatings being carried by an outer surface of said one sheet in engagement with said electrically conductive spring means and the other of said coatings being carried by one of said inner surface regions of said sheets to be engaged by said inner enlarged head end of said switch-operating means, whereby said switch-operating means may be moved in opposition to said spring means to displace said inner enlarged head end away from said one sheet toward said other sheet to change the relationship between said inner enlarged head end of said switch-operating means and said other coating so as to change the condition of a circuit of which said coatings form a part.

4,001,535

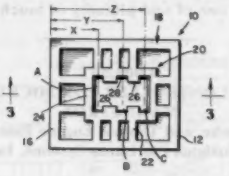
MULTI-STATION PUSH BUTTON FOR GAS SWITCHES

Charles E. Scott, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Aug. 11, 1975, Ser. No. 600,241

Int. Cl.² H01H *13/14*

U.S. Cl. 200—340 **4 Claims**



1. A multi-station push button comprising:

a. an outer case having side walls,

b. a compartment carried within said case having at least two side walls in spaced parallel relationship,

c. means attached to and distinguishable from said compartment side walls which by itself divides said compartment into successive in-line adjacent stations for receiving any one of plurality of switch actuators with various center distances therebetween, said means located along said compartment side walls such that a first station is disposed a predetermined distance from one wall of said case side walls, the next two of said stations being spaced from said first station in-line such that the ratios of the distance from the centerlines of said next two in-line stations to said one wall to the distance from the centerline of said first station to said one wall are about 1.5 and 2.0 respectively.

4,001,536

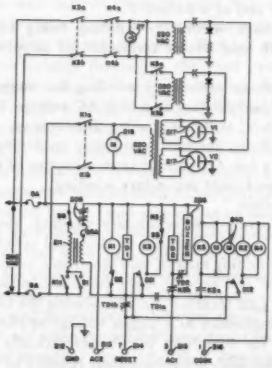
MICROWAVE OVEN CONTROLS

Mark Edward Eberhardt, Jr., Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Feb. 14, 1975, Ser. No. 549,922

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **12 Claims**



1. A control circuit for controlling the operating cycle of an appliance comprising:

oscillator means for providing an oscillating signal which alternates between two voltage levels,

a plurality of touch plate means receiving said oscillating signal, each said touch plate means providing said oscil-

lating signal at its output when untouched and providing at its output a modified oscillating signal when touched, said modified oscillating signal having an increased minimum voltage level,

detector means connected to the outputs of said plurality of touch plate means for detecting application of an oscillating signal having an increased minimum voltage level, and

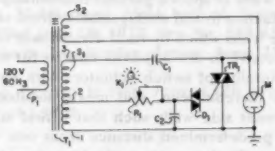
timing means connected to said detector means for setting the operating cycle of said appliance in response to the touching of one of said plurality of touch plate means.

4,001,537

POWER CONTROLLER FOR MICROWAVE MAGNETRON

Robert Virgil Burke, and Thomas Eugene Hester, both of Fort Wayne, Ind., assignors to Litton Systems, Inc., Huntington, Ind.

Filed July 24, 1975, Ser. No. 598,865
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 B **8 Claims**



1. An adjustable power operating circuit for a microwave magnetron in a microwave oven, said magnetron having an anode terminal and a pair of heater-cathode terminals, and possessing unidirectional current-conducting characteristics between the anode and cathode thereof and operative to generate microwave frequency energy responsive to the application of a voltage of magnitude V_n volts between the anode and cathode thereof in which the polarity of such voltage is negative at said cathode, comprising:

a high leakage reactance transformer containing a primary winding, a low voltage secondary winding and a high voltage secondary winding;

said primary winding being adapted for connection to an AC voltage source, which voltage is sinusoidally varying in polarity and of a period T;

said low voltage secondary winding being connected in circuit with said heater terminals for supplying current thereto;

said high voltage secondary winding for stepping up the voltage of said primary to a high AC voltage V_s, where V_s is less than V_n volts, appearing thereacross;

said high voltage secondary winding including a tap for providing a low AC voltage representative of the high AC voltage across said secondary winding;

capacitor means;

means connecting said secondary winding, said capacitor means and said magnetron in electrical series circuit;

electronic switching means, said electronic switching means having first and second main current-conducting terminals and a gate terminal, and possessing the characteristic of being responsive to a trigger voltage applied to its gate electrode for switching into an electrically conductive state substantially instantaneously relative to one-half the period of said AC source and which restores to the electrically nonconductive state responsive to the instantaneous value of current therethrough reducing to zero;

said first and second main terminals being connected, respectively, in circuit with said anode and cathode terminals, respectively, of said magnetron to place said electronic switching means in shunt of said magnetron;

phase shifting circuit means having an input and an output for introducing a phase shift between an AC signal applied at said input and an AC signal as appears at said output, said phase shifting circuit including:

adjustable means for permitting selective adjustment of the amount of said phase shift;

an accessible positionable control member;

scale means associated with said control member for visually representing power levels as a function of the position of said positionable control member; and

means coupling said control member to said adjustable means to permit adjustment of said adjustable means as a function of the position of said control member;

means connecting said input of said phase shifting circuit to said tap on said secondary for providing an AC voltage to said input;

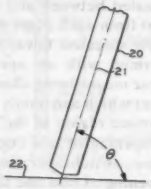
triggering means coupled to said gate terminal and to said output of said phase shifting network responsive to the output of said phase shifting network attaining a predetermined level during each AC cycle at a time when voltage at the magnetron heater-cathode is positive relative to the anode for providing a trigger voltage pulse at least once during each AC cycle to said gate terminal of said electronic switching means; whereby said capacitor may be charged to a voltage during the half cycle of AC which voltage is additive with the voltage V_s in the next succeeding half cycle and the sum of which voltages is at least equal to V_n volts.

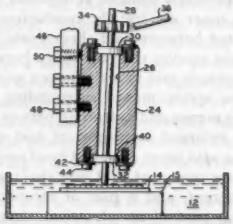
4,001,538

METHOD AND APPARATUS FOR PRODUCING SMOOTH SURFACES

Arnold Michalski, Piedmont, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Apr. 17, 1975, Ser. No. 569,331
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 M **24 Claims**





1. A method for producing a continuously smooth surface on a metal workpiece having an irregular surface comprising a nonsmooth area bordered by a smooth area, which method comprises:

electrically removing metal from said nonsmooth area and said bordering smooth area by subjecting said areas to electrical discharge machining with one end of an electrode which is rotating about its axis and which is inclined at an acute angle, measured between said electrode axis

and said workpiece, within the range of from 85° to 89.4°; and

thereby blending said nonsmooth area into said smooth area.

4,001,539

CONTROL SYSTEMS FOR WELDING MACHINES

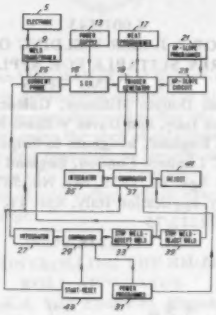
Adriano Franchi, and Paolo Brandani, both of Tavarnelle Val Di Pesa (Florence), Italy, assignors to Axis S.p.A., Tavarnelle Val Di Pesa (Florence), Italy

Filed Nov. 12, 1974, Ser. No. 523,278

Claims priority, application Italy, Nov. 13, 1973, 9679/73

Int. Cl.² B23K 11/24

U.S. Cl. 219—110 4 Claims



1. In a welding machine having welding electrodes an electronic control system comprising

an electrical supply source,

a current control unit connected to supply current from said supply source to the welding electrodes and having a control input for controlling current fed to the welding electrodes,

a pulse generator connected to supply control pulses to said control input of said control unit so that by varying the phase shift of the pulses, the current fed to the welding electrodes is also varied,

sensing means connected to sense the instantaneous current consumed by the welding electrodes and arranged to provide an output in dependence thereon,

integrating means connected to receive the output from said sensing means and arranged to provide an output indicative of the total current supplied to the welding electrodes,

means for generating a reference signal,

comparison means for comparing the reference signal with the output from said integrating means and operative when equality is reached to inhibit the supply of control pulses from said pulse generator to the current control unit, and simulating means having

first means connected to receive a signal from said pulse generator and operative in response thereto to provide an output representative of the total power that the welding electrodes would be expected to consume as a result of the control pulses,

second means responsive to the output of said first means and said reference signal and operative to generate an output when equality is detected, and

third means responsive to the output of said second means and said comparison means to generate a fault indicating signal and to inhibit said pulse generator when the output of said second means occurs prior to the output of said comparison means.

4,001,540

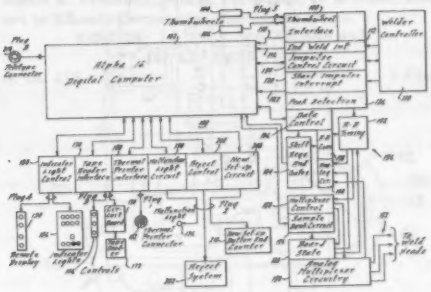
WELDING MONITORING AND CONTROL SYSTEM

Charles J. Drake, Detroit, and John F. Farrow, Ypsilanti, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Dec. 18, 1974, Ser. No. 534,341

Int. Cl.² B23K 11/24

U.S. Cl. 219—110 10 Claims



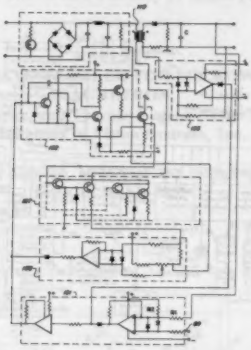
1. In combination, a welding control system and a pulse welder having a welding cycle including heat portions and and cool portions, the pulse welder including at least one welding head, a source of welding pulses, a standard control circuit connected between the source and the welding head for controlling the application of alternate of the heat and cool portions to a welding load by controlling the number of welding pulses fed to the load during the heat portion and the duration of the cool portion, the standard control circuit including means for generating a series of clock pulses for controlling the duration of the heat and cool portions of the welding cycle of the load by counting a preselected number of clock pulses in the heat and cool portions of the cycle, and means connected to the standard control circuit for altering the duration of the heat and/or cool portions of the cycle cunted by the standard control, the improvement comprising start means for sensing the start of the weld, sensing means for sensing a first set of voltage and current characteristics flowing in the load during a heat portion, means for generating a standard impedance characteristic from said sensed first set of voltage and current characteristics flowing in the load and storing said standard characteristic, an interface circuit connected to the current and voltage sensing means and said impedance characteristic generating means for feeding the voltage and current signals to said impedance characteristic generating means, said sensing means sensing and feeding a second set of voltage and current characteristics to said impedance characteristic generating means, said generating means generating a sensed impedance characteristic from said second set for each pulse in said second set of said voltage and current characteristics, means for comparing said sensed impedance characteristics of each pulse of the weld with the standard impedance characteristic and generating an altering signal for each pulse in said second set when the sensed impedance characteristic is not within the standard characteristics, altering means connected to the standard control for altering the heat and/or cool portions to maintain said sensed impedance characteristic within limits of said standard characteristic, and new standards generating circuit means for generating a new standard impedance characteristic from said second set of voltage and current characteristics and said first set of characteristics, and means for altering the weight of said standard characteristic relative to each sensed impedance characteristic.

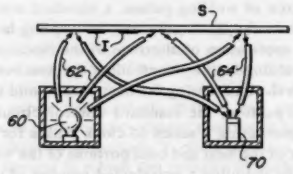
4,001,541

FLASH FUSING SYSTEM WITH ENERGY CONTROL

Gilbert J. Hatch, Walworth, N.Y.; Richard C. Johnson, Pasedena, Calif., and Ihor Kulbida, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 11, 1975, Ser. No. 585,944
Int. Cl.² G03G *15/20*
U.S. Cl. 219—216 5 Claims





1. An improved flash fusing system for fusing toner images onto support material comprising:

flash lamp means,

means for advancing support material bearing loose toner images along a path past said flash lamp means;

a power supply means coupled to said flash lamp means including a transformer means having a secondary winding coupled to a chargeable capacitor means for energizing said flash lamp means and means for sensing the energy on said capacitor means; and

sensing means for sensing the density of toner images on the copy sheets advanced and producing signals directly proportional to the total reflectivity of the toner images and transmitting said signals to the power supply means for controlling the charge on said capacitor means to a predetermined level.

4,001,542

METHOD AND APPARATUS FOR FORMING A STREAM FEEDER

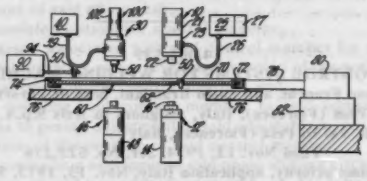
Ronald O. McCormick, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 13, 1975, Ser. No. 586,837
Int. Cl.² B23K *11/00*
U.S. Cl. 219—117 R 18 Claims

1. The method of forming an orificed container for flowing streams of molten glass comprising:

a. successively punching apertures through a plate with each of the apertures being punched through the plate from the same first side; and

b. deforming the plate immediately adjacent each of the apparatus at the second side of the plate before punching succeeding apertures from the first side to such an extent



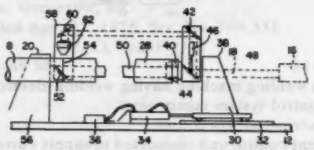
that bowing of the plate otherwise occurring from the punching is essentially negated, thereby keeping the plate flat.

4,001,543

APPARATUS FOR A LASER WELDING OF A PIPELINE, PARTICULARLY SUITABLE FOR APPLICATION ON PIPE-LAYING SHIPS

Ottavio Bove, San Donato Milanese; Galeazzo Grossi, Spino D'Adda, both of Italy, and David William Kirkley, Kingston upon Thames, England, assignors to Saipem S.p.A., Milan, Italy and BOC Limited, London, England

Filed Apr. 11, 1975, Ser. No. 567,107
Claims priority, application Italy, Apr. 11, 1974, 21279/74; Mar. 13, 1975, 21222/75
Int. Cl.² B23K *26/00*
U.S. Cl. 219—121 L 26 Claims



1. An apparatus for welding a pipe spool to a pipeline from the inside and/or from the outside of the pipe spool to be welded, particularly suitable for application on pipelaying ships or barges, which apparatus comprises a stand fixed relative to the pipeline for supporting and securing one end of the pipeline; means for aligning a pipe spool with the secured pipeline end and for maintaining one end of the spool in contact with the pipeline end; means for holding the axis of the spool coaxial with that of the pipeline; at least one laser source arranged to direct a beam of coherent radiation along the axis of the pipeline, and means for rotating at least one reflecting surface positioned in the path of the beam so that the laser beam, after reflection from the surface falls substantially radially on the abutting pipe ends and is caused to make at least one complete revolution about the pipeline axis, the energy of the beam being such that it is able to weld the abutting pipe ends together by fusion.

4,001,544

APPARATUS FOR FIXING ELECTROPHOTOGRAPHIC IMAGES

Paul Heinzer, and Helmut Wulz, both of Zurich, Switzerland, assignors to Wifo Wissenschaftliches Forschungs-Institut A.G., Zurich, Switzerland

Filed Nov. 8, 1974, Ser. No. 522,127
Claims priority, application Switzerland, Nov. 16, 1973, 16142/73; Oct. 4, 1974, 13384/74
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 22 Claims

1. An apparatus for fixing electrophotographic images carrying toner powder imposed on image-bearing sheets which

comprises, a housing, a fixing roller rotatably mounted in said housing, a counter roller rotatably mounted in said housing, means for rotating the counter roller and the fixing roller associated therewith, said fixing and counter rollers being disposed substantially parallel with respect to each other and defining therebetween a nip for the passage of said sheets between said rollers, said rollers having tubular shells which remain in contact with said sheets throughout their passage

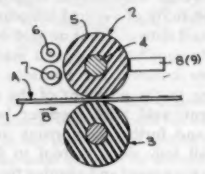
through said nip and the shell of said fixing roller being made of a thin, resiliently deformable material of high thermal conductivity, a heating means disposed within the fixing roller and pressure means for urging the shell of said fixing roller towards the counter roller and operative to deform said shell to provide, in the absence of a sheet in said nip, a zone of contact between the shells of said rollers which extends over a substantial angular range.

4,001,545

DEVICES FOR CONTROLLING THE HEATING OF FUSER ROLL APPARATUS

Kenichi Wada, Sakai; Yuji Enoguchi, Higashiosaka; Masaya Ogawa, Sakai; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Susumu Tanaka, Sakai; Takao Fujiwara, Sakai, and Hiroshi Murasaki, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 28, 1975, Ser. No. 581,437
Claims priority, application Japan, June 15, 1974, 49-68288
Int. Cl.² G03G *15/20*
U.S. Cl. 219—216 **5 Claims**



1. Apparatus for controlling the heating of fuser roll mechanisms in an electrophotographic copying machine, comprising:

a pair of rollers including a fuser roll and a pressure roll for passage therebetween of a supporting sheet bearing toner powder image thereon;

at least first and second heating means for heating substantially the entire surface of said fuser roll to temperatures suitable for fusing the toner image on the supporting sheet, said first heating means being mounted along the axis of said fuser roll to heat at least the central portion of said fuser roll and said second heating means being mounted concentrically and transversely to the axis of said fuser roll to heat at least the end portions of said fuser roll;

at least first and second detecting means for detecting surface temperatures of said fuser roll, said first detecting means being adapted to detect the temperature of the central portion of said fuser roll and said second detecting means being adapted to detect the temperature of the end portions of said fuser roll; and

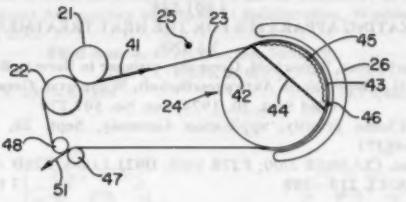
control means connected to said first and second detecting means for controlling said first and second heating means individually whereby substantially the entire surface of said fuser roll is maintained at said suitable temperature.

4,001,546

FILM THERMAL PROCESSING

Olof C. Johnson, Jr., Chelmsford; Robert E. Whitney, and Dieter K. Froehling, both of Burlington, all of Mass., assignors to Eikonix Corporation, Burlington, Mass.

Filed July 14, 1975, Ser. No. 595,892
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **9 Claims**



1. Thermal developing apparatus comprising,

electrically and thermally conductive drum means having a heated developing segment,

belt means relatively moveable with respect to said drum means for carrying film to be developed across said heated developing segment,

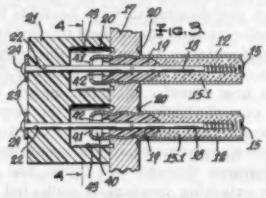
and means for establishing an electrostatic field for producing electrostatic forces and static electricity on the belt means that keep the film to be developed in firm contact with said belt means as the latter carries the film around a portion of said drum means including said developing segment to uniformly develop the film.

4,001,547

ELECTRIC HEATING ELEMENTS

Alben C. Boggs, and Robert D. Shirey, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 642,682
Int. Cl.² F24H *1/00*
U.S. Cl. 219—322 **9 Claims**



1. In an electric immersion heating element having a metal sheath, a resistance conductor within said sheath and electrically insulated therefrom, said resistance conductor having a terminal end partly within an outer end portion of said sheath and extending outwardly of an open end of said sheath at said end portion, said heating element also having a metallic mounting member mechanically and electrically connected to said sheath at said outer end portion, said mounting member being connectable to the metal wall of a grounded container in electrical continuity therewith, said mounting member supporting said sheath for extension through an opening in said wall so that an inner portion of said sheath is immersed in fluid within said container, the improvement comprising:

means for protecting said heating element from damage in the event the latter is subjected to voltage which is in excess of its range of normal operating voltage, said protecting means comprising a spark gap between said sheath outer end portion and said terminal end of said resistance conductor, said gap being of a size to conduct voltage only when said conductor terminal end is subjected to voltage beyond the range of the normal operating voltage of said heating element, whereby the voltage so conducted is harmlessly led to ground via said sheath, said mounting member and said container, without damage to said heating element.

4,001,548

HEATING APPARATUS FOR THE HEAT TREATMENT OF YARNS

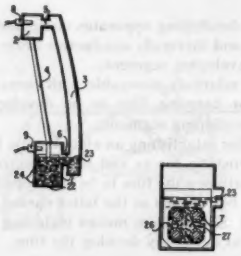
Karl Bauer, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Sept. 20, 1974, Ser. No. 507,779

Claims priority, application Germany, Sept. 26, 1973, 2348371

Int. Cl.² H05B *3/00*; F27B *9/08*; D02J *13/00*; F28D *15/00*

U.S. Cl. 219—388 **7 Claims**



1. Heating apparatus for the heat treatment of synthetic yarns having a substantially closed liquid-vapor system operable under the vapor pressure of an evaporable and condensable heat-transfer medium, comprising an evaporator member extending in axial direction of the apparatus, filled at least partly with liquid heat transfer medium; electric resistance heating elements extending axially through said member; a plurality of yarn-heating, substantially vertical tubes having heat conductive, yarn-heating surfaces heatable by the vapors of the heat transfer medium for the heat treatment of the yarns passing along said surfaces; a condenser above and positioned substantially parallel to the evaporator member, for collecting the condensed heat transfer medium vapors; branch tube means for the communication of all of the respective tubes with both the evaporator member and the condenser for flow of vaporized heat transfer material from said evaporator member to the condenser through said tubes; and at least one return line for returning condensate collected in the condenser to the evaporator member, the improvement comprising at least several, axially spaced, baffleplate walls positioned transversely in the evaporator member with openings therein through which extend said heating elements, passage means providing liquid communication between the spaces in said evaporator member between the baffle plates, the baffle-plate walls extending upwardly beyond the phase boundary between the liquid heat transfer medium and the vapor space in said evaporator member, and said baffle plate walls being at least substantially coextensive with the entire, liquid moistened, cross section of the evaporator member which is axially traversed by said heating elements for effectively damping any local pressure waves created between the adjacent baffle-plate walls.

4,001,549

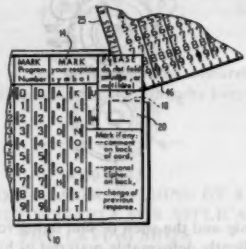
MARKING DOCUMENT AND TEMPLATE ASSEMBLY AND METHOD OF MAKING THE ASSEMBLY

Edward J. Corwin, 200 Central Park South, Apt. 15B, New York, N.Y. 10019

Continuation-in-part of Ser. No. 151,676, June 10, 1971, abandoned. This application May 26, 1972, Ser. No. 257,298

Int. Cl.² G06K *19/06*

U.S. Cl. 235—61.12 R **3 Claims**



1. In combination:

a. A document having a plurality of vertical data columns and a column of sequential indicia identifying a plurality of horizontal document rows, each data column comprising a plurality of vertically-spaced marking areas corresponding to respective ones of said sequential indicia and adapted to be manually marked, the marking areas corresponding to vertically adjacent ones of said indicia being located on opposite sides of an imaginary vertical line dividing said data column into two marking columns, and the vertically adjacent marking areas in each marking column being vertically displaced from each other by a distance substantially equal to the vertical dimension of a marking area; the marking areas corresponding to respective ones of said indicia being horizontally aligned in respective ones of said document rows; and

b. A marking template assembly for use with said document and comprising: a document-supporting base member, a template hinged to one end of said base member and adapted to overlie a document supported on said base member, a plurality of vertical template columns corresponding to said data columns on said document, and two columns of horizontally staggered marking openings in each template column, the positions of said openings corresponding to the positions of the marking areas on said document; said base member being substantially rectangular and further comprising an upstanding rim formed on all four sides thereof to form a cavity for receiving the document and aligning the marking areas on the document with the marking openings in the template.

4,001,550

UNIVERSAL FUNDS TRANSFER AND IDENTIFICATION CARD

Vernon L. Schatz, 250 Sunset Ridge Road, Northfield, Ill. 60093

Filed Dec. 4, 1975, Ser. No. 637,712

Int. Cl.² G06K *5/00*, *19/06*; G11C *11/02*

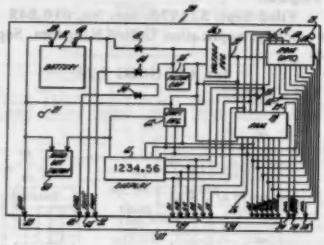
U.S. Cl. 235—61.7 B **13 Claims**

1. In a universal funds transfer and identification card for use with electronic terminals adapted to perform transactions and produce signals for carrying out and recording said transactions, the improvement comprising, random access memory means in said card for storing information including the following changeable information:

account balance,

total amount of transactions since last update of card, and date of last update; connecting means along a single edge of said card adapted to mate said terminal for cou-

pling signals between said card and said terminal, and means coupling said connecting means to said random access memory means for selectively addressing fields



within said memory means and transferring data between addressed fields and said terminal, whereby said card serves as an up to date record of said account.

4,001,551

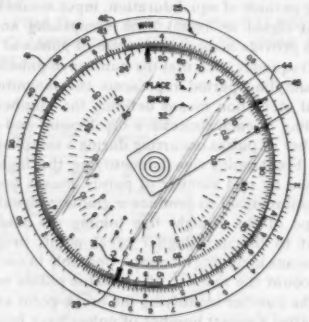
CALCULATOR

Paul A. Hirsimaki, 4106 Decatur St., Hyattsville, Md. 20781

Continuation-in-part of Ser. No. 450,758, March 13, 1974, abandoned. This application Nov. 1, 1974, Ser. No. 520,155

Int. Cl.² G06G 1/10

U.S. Cl. 235—70 A **8 Claims**



1. A calculator for calculating the odds for a selected entrant in a predetermined wagering pool for one of the different winning positions in the pari-mutuel system of wagering from a knowledge of the total amount of money wagered in said predetermined wagering pool and the amount of money wagered on each of the pool profit sharing entrants, comprising:

a first member having first indicia thereon representative of amounts wagered on each said entrant and the total amount wagered in said pool;

a second member movable relative to said first member, said second member having second indicia thereon for cooperating with said first indicia to determine the percentage of said total amount wagered on one or more of said entrants, said second member further including odds indicia representative of at least one of said different winning positions;

a third member movable relative to said first and second members, said third member having indicia thereon representative of the percentage of amounts wagered on the other entrant or entrants sharing said predetermined wagering pool with said selected entrant, said third indicia including an index; and

a cursor movable relative to said first, second, and third members, said cursor having a hairline thereon, said first, second, third, and odds indicia being positioned on said calculator such that when said total amount wagered in said predetermined pool as shown on said first indicia is set adjacent the one hundred percent index on said second indicia, the third indicia index is set adjacent the amount wagered on said selected entrant as shown on said first indicia, and the cursor hairline is set on the percentage of preselected pool-sharing wagers for entrants expected to share in the pool with the entrant of interest on said third indicia, the odds for said selected entrant will be indicated by said hairline on said odds indicia.

4,001,552

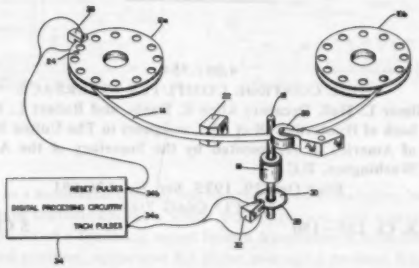
METHOD AND APPARATUS FOR MEASURING WEB MATERIAL WOUND ON A REEL

Ronald M. Muller, Brandywine, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 4, 1975, Ser. No. 565,289

Int. Cl.² H03K 21/18

U.S. Cl. 235—92 DN **17 Claims**



1. Apparatus for identifying a number of layers of a thin, flexible web material wound on a reel as the reel is rotated, said web having a thickness t, comprising first pulse generating means synchronized with the rotation of said reel to generate one pulse upon each revolution of said reel; second pulse generating means synchronized to movement of segments of said web relative to said reel for generating one pulse per segment, each of said segments having a length $2\pi t$ along the length of said web and each layer of said web on said reel having a $2\pi t$ length difference from the previous adjacent web layer; said second pulse generating means further synchronized with said segments of said web to generate a difference of one pulse upon each additional revolution of said reel; and means for receiving said pulses from said first and second pulse generating means and converting said pulses to a signal identifying said number of layers.

4,001,553

COUNTER ARRANGEMENT AND ASSOCIATED TEST CIRCUIT FOR AN ELECTRONIC TIMING DEVICE

Bruce L. Troutman, Long Beach, and Emory N. Yount, Fullerton, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 17, 1975, Ser. No. 614,106

Int. Cl.² H03K 21/30

U.S. Cl. 235—92 MS **10 Claims**

1. An electronic counting circuit having means by which to test the accuracy of said circuit during a first mode of operation and to count the number of signals applied to said circuit during a second mode of operation, said counting circuit including:

clock terminal means to receive a clock signal having an operating frequency,

counter means comprising a plurality of divider stages, each

of said stages having a respective input and output terminal thereof,

said clock terminal means connected to the input terminal of a first of said divider stages,

utilization means connected to the output terminal means of each of said divider stages and responsive to the frequency of the respective signals thereat in order to provide an indication as to the accuracy or the signal count of said counting circuit,

control means connected between said clock terminal means and said counter means and adapted to selectively connect said clock terminal means to the respective input terminal of a second and succeeding ones of said plurality of divider stages in said first mode of operation so that each of said divider stages concurrently divides the operating frequency of said clock signal, and

said control means adapted to selectively connect the output terminal of each of said plurality of divider stages to the input terminal of a succeeding one of said divider stages in said second mode of operation so that each of said divider stages successively divides the operating frequency of said clock signal.

4,001,554

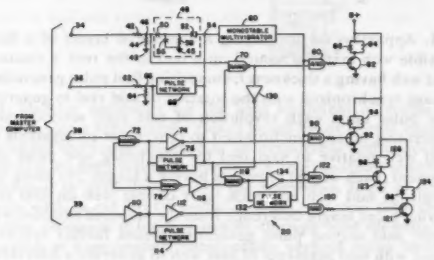
MODE CONTROL COMPUTER INTERFACE

Kilmer L. Hall, Decatur; Allen E. Davis, and Robert L. Peck, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1975, Ser. No. 626,681

Int. Cl.² G06G 7/48

U.S. Cl. 235—150 **5 Claims**



1. In a computer network wherein plural computers must be simultaneously activated and deactivated, the improvement of a mode control interface for providing simultaneous operation of said computers, and comprising: a plurality of control circuits coupled between a first of said computers and other of said computers, each of said control circuits being responsive to a voltage input to provide an isolated voltage output pulse of predetermined time duration; a control switch coupled to said control circuits for providing activating power to said interface; a first of said control circuits being an AND gate having first and second inputs, first and second series connected inverters coupled between the said first computer and said first input of said AND gate, a transistor switch coupled to the output of said AND gate, a relay coupled in series with said transistor and the activating power from said control switch, and a control of said relay coupled to other of said computers for coupling power therethrough when activated by said relay; and a monostable multivibrator having an output connected to the second input of said AND gate for providing a predetermined signal pulse width thereto and having the input thereof coupled between said series connected inverters for receiving an activating pulse therefrom.

4,001,555

SIGNAL PROCESSING APPARATUS

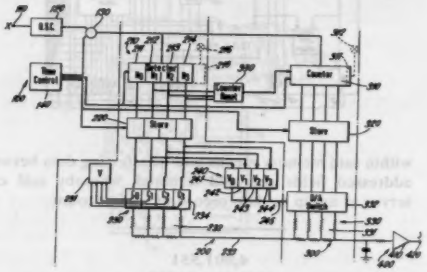
Peter Stanley Levis, Bramhall, and Geoffrey Shepherd, Oldham, both of England, assignors to Ferranti, Limited, Hollinwood, England

Filed Sept. 5, 1975, Ser. No. 610,848

Claims priority, application United Kingdom, Sept. 6, 1974, 38948/74

Int. Cl.² G06G 7/28

U.S. Cl. 235—150.53 **14 Claims**



1. Signal processing apparatus for weighting an input signal in accordance with a predetermined mathematical transfer function represented by a plurality of straight lines each of which intersects the next at a separate brak-point, the apparatus comprising control means operable to define a succession of sampling periods of equal duration, input means responsive to an input signal in digital form comprising an oscillator operable to provide a continuous train of pulses at a constant repetition frequency such that the number of pulses generated during a sampling period represents the magnitude of the input signal, detection means defining the number of pulses corresponding to each successive break-point and responsive to the number of pulses occurring during a sampling period to produce a break-point signal identifying the highest break-point defined by said number of pulses, means responsive to the break-point signal to produce a gradient signal indicative of the slope of the straight line joining the said identified break-point to the next higher break-point, programmable counting means including a counter operable in each sampling period to count the number of oscillator pulses occurring in excess of the number identifying the break-point and produce an output after a preset number of pulses have been counted, gating means operable to pass pulses from the oscillator to the counter and to the detection means and responsive to the output from the counter to inhibit passage of the oscillator pulses for the remainder of the sampling period, means responsive to the number of pulses counted and to the gradient signal to provide an intermediate signal representative of the product of the input signal, in excess of the break-point, and the slope of the straight line section, and output means operable to deliver an output signal representative of the sum of the break-point signal and the intermediate signal.

4,001,556

COMPUTER CONTROLLED PNEUMATIC RETRACTABLE SEARCH SENSOR

George A. Folchi, Yorktown Heights; Sherman S. Wang, Mohegan Lake, both of N.Y.; Peter M. Will, Norwalk, Conn., and Moshe M. Zloof, White Plains, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

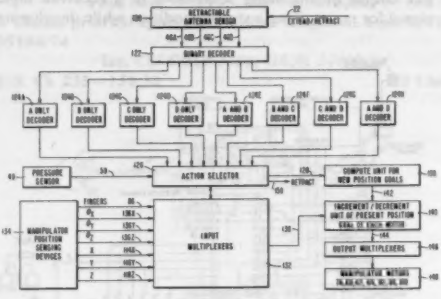
Filed Apr. 7, 1975, Ser. No. 565,930

Int. Cl.² B25J 9/00; G06F 15/46

U.S. Cl. 235—151 **11 Claims**

1. A mechanical manipulator comprising fingers for grasping a workpiece, an extendible sensing device on said fingers which includes a long, thin whisker antenna, means for extending said whisker antenna, means for detecting contact or

proximity of said whisker antenna with said wo.kpiece, means for withdrawing said whisker antenna from interference with said workpiece, means responsive to said detecting means to



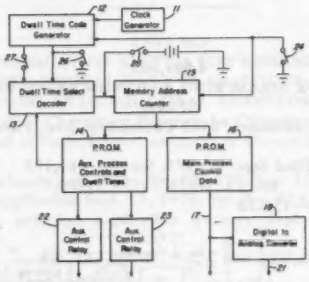
adjust the control movements of the manipulator fingers, and means for controlling extension and retraction of said whisker antenna.

4,001,557

STORED PROGRAM DIGITAL PROCESS CONTROLLER

Dwight L. Stephenson, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 14, 1975, Ser. No. 621,894
Int. Cl.² G05B 19/02; G05D 23/00; G06F 15/46
U.S. Cl. 235—151.1 1 Claim



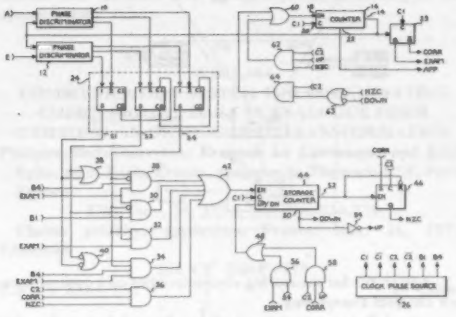
1. Digital process controlling apparatus comprising:
a clock generator;
a dwell time code generator connected to said clock generator for providing a plurality of pulse frequencies;
dwell time select decoder connected to said dwell time code generator selecting desired pulse frequencies;
memory address counter means in circuit with said dwell time select decoder for converting said pulse frequencies to memory addresses;
a first programmable read only memory having an input from said memory address counter and an output to said dwell time select decoder for setting dwell times corresponding to memory addresses;
a second programmable read only memory having an input from said memory address counter having process variables stored therein at addresses coinciding with the corresponding dwell times stored in said first programmable read only memory;
process control means connected to the output of said second programmable read only memory; and,
an auxiliary process control relay connected to the output of said first programmable read only memory.

4,001,558

AVERAGE PHASE POSITION CIRCUIT

Leroy U. C. Kelling, Waynesboro, Va., assignor to General Electric Company, New York, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,293
Int. Cl.² G05D 3/04
U.S. Cl. 235—151.11 6 Claims

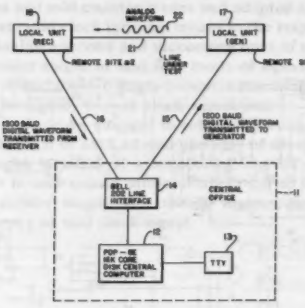


1. In a numerical control machine tool system including two position transducers for a single axis of motion, and wherein the phase of a feedback signal from a transducer is indicative of tool position, apparatus for phase averaging position feedback signals derived from each transducer to produce a resultant position signal, said apparatus comprising:
a source of clock pulses;
counter means responsive to said clock pulses for producing the resultant position signal and a reference signal at clocked intervals;
a first phase discriminator having a first input terminal connected to receive a first position feedback signal from one of the position transducers and having a second input terminal connected to receive said reference signal, said first phase discriminator producing a first signal proportional to the phase difference between the first position feedback signal and said reference signal;
a second phase discriminator having a first input terminal connected to receive a second position feedback signal from the other of the position transducers and having a second input terminal connected to receive said reference signal, said second phase discriminator producing a second signal proportional to the phase difference between the second position feedback signal and said reference signal;
summing means connected to receive said first and second signals and responsive thereto to produce a third signal proportional to the difference therebetween;
error storage means;
gating means for periodically transferring said third signal to said error storage means;
control means connected between said error storage means and said counter means, said control means being responsive to said third signal stored in said error storage means to periodically adjust the clocked interval of said counter means to thereby control the phase relationship between said reference signal and the first and second position feedback signals by application of a gating signal to said counter means.

4,001,559
PROGRAMMABLE MEASURING

Deane C. Osborne; John M. Harrison, both of Epsom, and Alfred K. Hillman, Jr., Suncook, all of N.H., assignors to Northern Telecom, Inc., Waltham, Mass.

Filed Dec. 16, 1974, Ser. No. 532,746
Int. Cl.² G08C 25/00; G06F 15/20
U.S. Cl. 235—151.31 13 Claims



1. Apparatus for measuring characteristics of a communication channel comprising,

means defining a communication channel for exchanging information signals between the ends of the communication channel,

means defining a programmable local unit at one end of said communication channel for exchanging signals with said communication channel,

central digital computing means for exchanging digital signals with said programmable local unit,

means defining a communications link between said digital computing means and said programmable local unit for exchanging digital data signals therebetween,

said programmable local unit including means responsive to the digital signals from said digital computing means for providing an analog signal waveform for transmission over said communication channel and means responsive to the received test analog signal transmitted over said communication channel for converting the received analog signal into a representative digital signal that is transmitted to said digital computing means to enable the latter to determine transmission characteristics of said communication channel.

4,001,560
APPARATUS FOR OPERATION SELECTOR CIRCUITS, ESPECIALLY TARIFF SELECTOR CIRCUITS IN ELECTRONICALLY OPERATED TAXIMETERS

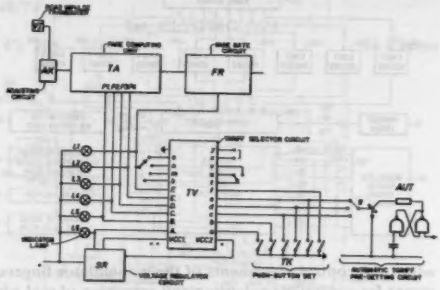
Carl Ib Peder Larsen, Slagelse, Denmark, assignor to Haldex Aktiebolag, Sweden

Filed May 29, 1974, Ser. No. 474,212
Claims priority, application Sweden, May 30, 1973, 7307691
Int. Cl.² G07B 13/10
U.S. Cl. 235—151.32 6 Claims

1. In an electronic taximeter of the type having a fare computing unit for computing a fare at a rate determined by logic signals applied thereto; a tariff selector circuit responsive to operating signals for developing and applying fare determining logic signals to said fare computing unit; and an operation switching unit operable to apply selected operating signals to said selector circuit for selectively developing fare determining logic signals; wherein said selector circuit comprises:

logic circuit means responsive to said operating signals for developing logic signals corresponding to different ones of said operating signals applied thereto; and

output circuit means receptive of said logic signals for developing said logic signals as tariff selector circuit output signals for controlling the fare computing unit, said output circuit means being responsive to a received logic signal for maintaining a stable condition while developing

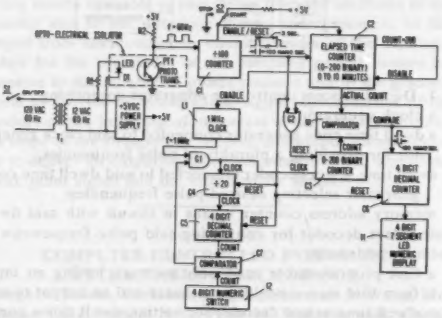


the received logic signal as an output signal and thereafter maintaining the output signal even in the absence of the received logic signal; and during intermittent application of the received signal, and developing a different output signal only upon receiving a different logic signal.

4,001,561
DEVICE FOR MEASURING AND INDICATING READING SPEED

William J. Quaintance, 8605 Cheltenham Ave., Philadelphia, Pa. 19118

Filed Sept. 4, 1975, Ser. No. 610,173
Int. Cl.² H03K 21/36, 21/18
U.S. Cl. 235—151.32 4 Claims



1. A reading rate indicator comprising:

elapsed time counting means;

input data entry means to allow the entry of a number corresponding to the number of words of text to be read;

computation means to operate on the output of the elasped time counter and the input data entry means to compute a number representative of a reading rate in words per minute;

display means to display the results of the computation.

4,001,562

SPEED SENSING DEVICES

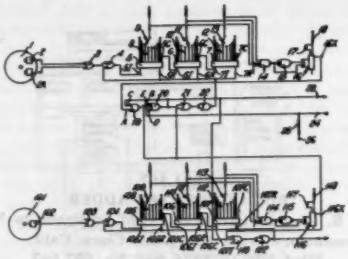
John McEnery, Herne Bay, England, assignor to Molins Limited, England

Filed Sept. 5, 1975, Ser. No. 610,782

Claims priority, application United Kingdom, Sept. 9, 1974, 39188/74

Int. Cl.² G01P 3/50; H03K 21/00

U.S. Cl. 235—151.32 3 Claims



1. A speed sensing device comprising a first sensor adapted to emit electric sensing pulses at a rate proportional to the speed at which a member moves past said sensor, a second sensor adapted to emit electric pulses at a rate proportional to the speed at which a reference member moves past said second sensor, and first and second pulse counters connected to receive and accumulate the sensing pulses and the reference pulses respectively, each of said counters being adapted to emit an output signal whenever a respective preselected number of pulses has been received by that counter since its last previous resetting and both said counters being arranged to be reset whenever an output signal is emitted by either counter.

4,001,563

COMMUNICATION SYSTEM FOR DISSEMINATING CODED DIGITAL DATA IN ANALOGUE FORM UTILIZING AN ORTHOGONAL TRANSFORMATION

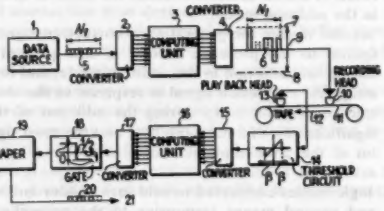
Phillippe Bied-Charreton; Francois Le Carvennec, and Erich Spitz, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 524,270, Nov. 15, 1974. This application Sept. 17, 1975, Ser. No. 614,159

Claims priority, application France, Sept. 17, 1974, 74.31424

Int. Cl.² G06F 7/38; G11B 5/09

U.S. Cl. 235—152 10 Claims



1. A communication system for the dissemination of digital data constituted by a succession of 0 and 1 bits coming from a data source, said communication system comprising: grouping means fed from said data source for grouping said bits in the form of vectors of N binary components, orthogonal Walsh Hadamard transformation means receiving the vectors having said binary components and converting them into orthogonal vectors each having N analogue components, analogue means arranged for disseminating said orthogonal vectors, a compensating circuit adapted for detecting the amplitude fluctuations experienced by said orthogonal vectors in said analogue means, said compensating circuit comprising a storage circuit, having an output, for temporarily storing characteristic values of said amplitude fluctuations, reverse transformation means receiving the disseminated orthogonal vectors, available at the output of said analogue means and means for reconstituting said succession of bits from the reconstructed vectors of N binary components furnished by said reverse transformation means, said means for reconstituting said succession of bits comprising a reshaping means operating at an adjustable decision level, said reshaping means having an adjusting input coupled to the output of said storage circuit, said decision level being adjusted according to said characteristic values.

4,001,564

COMMUNICATION SYSTEM FOR DISSEMINATING CODED DIGITAL DATA IN ANALOGUE FORM UTILIZING AN ORTHOGONAL TRANSFORMATION

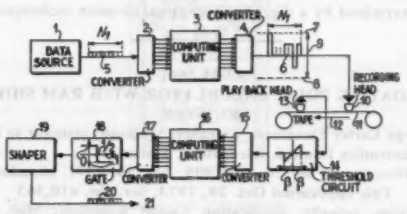
Philippe Bied-Charreton; Francois Le Carvennec, and Erich Spitz, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 15, 1974, Ser. No. 524,270

Claims priority, application France, Nov. 16, 1973, 73.40880

Int. Cl.² G06F 7/38

U.S. Cl. 235—152 10 Claims



1. A communication system for the dissemination of digital data constituted by a succession of 0 and 1 bits coming from a data source, said communication system comprising: grouping means fed from said data source for grouping said bits in the form of vectors of N binary components, orthogonal transformation means receiving the vectors having said binary components and converting them into orthogonal vectors each having N analogue components, analogue means arranged for disseminating said orthogonal vectors, reverse transformation means receiving the disseminated orthogonal vectors, available at the output of said analogue means, and means for reconstituting said succession of bits from the reconstructed vectors of N binary components furnished by said reverse transformation means.

4,001,565

DIGITAL INTERPOLATOR

Hisasi Kawai, Toyohashi, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed May 20, 1975, Ser. No. 579,159

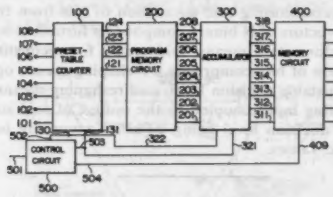
Claims priority, application Japan, June 25, 1974, 49-72939

Int. Cl.² G06F 15/34

U.S. Cl. 235—152 7 Claims

1. A digital interpolator for determining $f(X)=y$ for a value of $X_1 < X < X_2$ and $X-X_1=n$ and $X_2-X=m$ where $f(X_1)=Y_1$ and $f(X_2)=Y_2$ are known values comprising a counter (100) having inputs of the variable X and a clock pulse input with the output of said counter changing in proportion to the number of clock pulses, a program memory circuit (200) connected to said counter and addressed by an output of said counter for repeated selective readout of predetermined pro-

gram values of $f(X_1)$ and $f(X_2)$ in response to clock pulses, an accumulator (**300**) connected to said program memory circuit for accumulating the output of said program memory circuit, a control circuit (**500**) connected to said accumulator and said counter for supplying a predetermined number of clock pulses to each of them, said accumulator accumulating a value



of $n \cdot f(X_1) + m \cdot f(X_2)$ after said predetermined number of clock pulses, and a memory circuit (**400**) connected to said accumulator for storing the output digits of said accumulator which are at and higher than Nth digit position where $A^N = n+m$ and A is the radix of the number system utilized, whereby the output of said program memory circuit is divided by $N=n+m$ so that an interpolated value

$$f(X) = \frac{n \cdot f(X_1) + m \cdot f(X_2)}{n+m}$$

is determined by a digital proportional division technique.

4,001,566

FLOATING POINT CALCULATOR WITH RAM SHIFT REGISTER

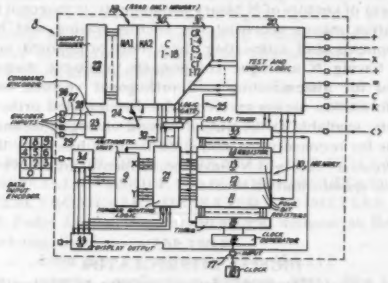
George Earley Stevenson, Kircaldy, Scotland, assignor to Pico Electronics Limited, Glenrothes, Scotland

Continuation of Ser. No. 165,908, July 26, 1971, abandoned. This application Oct. 29, 1973, Ser. No. 410,363

Claims priority, application United Kingdom, Mar. 19, 1971, 7372/71

Int. Cl.² G06F *7/52*

U.S. Cl. 235—159 **26 Claims**



1. A floating-point calculator circuit comprising: input means for the input of numerical data to the circuit; a plurality of registers including write and read lines and including a plurality of digit storage locations for storing numerical data in BCD form and each of said registers being a random-access static memory; an arithmetic unit for operating on numerical values stored in said registers; controllable data paths connecting said input means and said arithmetic unit to said registers; reversible-direction timing means for sequentially and reversibly addressing the digit storage locations of each of said registers; and distinct digit transfer means for controlling data shifts in each of said registers, the respective digit transfer means being coupled to the write and read lines for transferring a digit from one of the digit storage locations to one of the adjacent ones of the digit storage locations for multiplication and division by ten operations, the direction of transfer depending upon the momentarily existing direction of operation of the timing means.

4,001,567

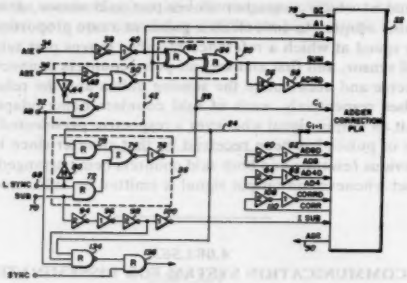
BDC CORRECTED ADDER

Richard B. Simone, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed July 21, 1975, Ser. No. 597,567

Int. Cl.² G06F *7/50*

U.S. Cl. 235—170 **7 Claims**



1. A BCD corrected adder having an addition mode and a subtraction mode, comprising:

a. a serial adder circuit responsive to each bit of two bytes and to a formerly generated bit carry for generating a sum and a present bit carry;

b. first means for generating a present byte carry whenever a present bit carry does not exist at the output of said adder during the addition of the most significant bit of a first byte and the most significant bit of a second byte, the result of which addition exceeds the decimal number ten in the addition mode;

c. second means for generating a correction signal in response to the presence of one of said present carries during said addition in the addition mode, and for generating said correction signal in response to the absence of said present bit carry during the addition of the most significant bit of a minuend byte and the most significant bit of the 2's complement of a subtrahend byte in the subraction mode; and

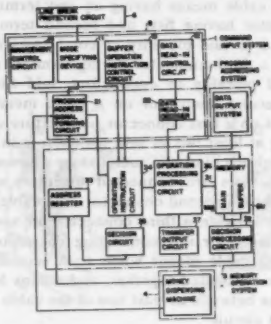
d. logic means connected to said serial adder and said first and second means responsive to the presence of said correction signal for generating simultaneously with the generatiion of said byte carry from said first means, each bit of a byte which is equal to the summation of said first byte, said second byte, and a byte equivalent to the decimal number six in the addition mode, and for generating simultaneously with the generation of said byte carry from said first means each bit of a byte which is equal to he summation of said minuend byte, the 2's complement of said subtrahend byte, and a byte equivalent to the decimal number ten in the subtraction mode.

4,001,568

MONETARY RECEIPT AND PAYMENT MANAGING APPARATUS

Nobuhiro Iizuka, and Hideto Shigemori, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Dec. 16, 1974, Ser. No. 533,469
Claims priority, application Japan, Dec. 29, 1973, 49-3791
Int. Cl.² G06F *15/02, 15/30*
U.S. Cl. 235—156 **4 Claims**



1. A monetary receipt and payment managing apparatus comprising:

a. transaction classification designating means for designating a transaction classification from among the transactions of monetary receipt, payment, exchange and change, for a transaction to be carried out;

b. transaction item designating means for designating a detailed transaction item for the transaction classification thus designated;

c. numerical data inputting means for inputting numerical data for the transaction item thus designated;

d. start commanding means for commanding starting of the apparatus for carrying out transactions based on input information inputted by said transaction classification designating means, transaction item designating means, and numerical data inputting means;

e. a buffer memory section coupled to said numerical data inputting means, said transaction classification designating means and said transaction item designating means and comprising a plurality of memory circuits which operate to store the numerical data inputted by said numerical data inputting means separately according to the transaction classification and transaction item inputted by said transaction classification designating means and transaction item designating means;

f. a main memory section coupled to said buffer memory section for storing the sum of transaction contents which have been stored in said buffer memory section;

g. money dispensing means in which money with a plurality of monetary denominations is stored, and for dispensing when necessary an amount of money according to the contents of said buffer memory section;

h. a program memory section for storing operation programs provided separately according to the transaction classifications; and

i. an operation control section to which said aforementioned means and sections are coupled for, when the starting of transaction is commanded by said start commanding means, operating to select a necessary operation program according to the contents of said transaction classification designating means, transaction item designating means, and buffer memory section, to effect a predetermined operation process according to the program thus selected, and for summing and renewing the contents of said main memory section on the basis of the contents of said buffer memory section, and for causing said money dispensing means to dispense a necessary amount of money when necessary,

whereby the apparatus collectively manages a variety of monetary transactions carried out by a teller with respect to cash and other than cash such as checks and bills.

4,001,569

GENERAL PURPOSE CALCULATOR HAVING SELECTIVE DATA STORAGE, DATA CONVERSION AND TIME-KEEPING CAPABILITIES

Peter D. Dickinson, Monte Sereno; Thomas E. Osborne, San Francisco; France Rode, and Allen J. Baum, both of Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 364,570, May 29, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,144
Int. Cl.² G06F *5/02*
U.S. Cl. 235—156 **10 Claims**

1. An electronic calculator comprising:

an input unit including a plurality of manually operable non-numeric and numeric keys for entering information and numbers into the calculator;

a first memory unit coupled to the input unit and including a first storage register for storing a first number in units of decimal degrees having an integer portion and a decimal portion received therefrom, said integer portion referring to all digits to the left of the decimal in conventional decimal notation and said decimal portion referring to all digits to the right of the decimal in conventional decimal notation;

a processing unit coupled to the input unit and the first memory unit and including means for converting the first number to a second number having first, second, and third parts representing said first number in units of degrees, minutes, and seconds respectively by multiplying the decimal portion of the first number by a preselected factor to provide a first result having an integer portion and a decimal portion and for multiplying the decimal portion of the first result by said preselected factor to provide a second result having an integer portion and a decimal portion; and

an output display unit coupled to the processing unit for providing a visual display of the second number;

said first part of the second number being the integer portion of the first number and appearing to the left of the decimal in said visual display;

said second part of the second number being the integer portion of the first result and appearing in said visual display as the first two digits to the right of the decimal;

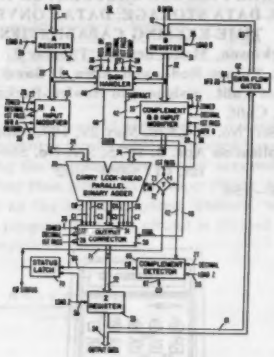
said third part of the second number being the integer portion of the second result and appearing in said visual display as the second two digits to the right of the decimal.

4,001,570

ARITHMETIC UNIT FOR A DIGITAL DATA PROCESSOR

David N. Gooding, Endicott, and Everett M. Shimp, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 17, 1975, Ser. No. 587,797
Int. Cl.[2] G06F 7/385
U.S. Cl. 235—174 14 Claims



1. An arithmetic unit for performing arithmetic operations with multidigit binary coded numbers in zoned format wherein each multidigit number is comprised of a sequence of binary bits which is subdivided into alternate zone fields and digit fields, such arithmetic unit comprising:

binary arithmetic circuitry for arithmetically combining two multibit binary bit sequences to produce an output multibit binary bit sequence representing the results of the arithmetic operation;

first modifier circuitry for receiving a first multidigit zoned binary coded number and causing any nonzero bits in the zone fields thereof to assume a binary value of zero and supplying the resulting number to a first input side of the binary arithmetic circuitry;

second modifier circuitry for receiving a second multidigit zoned binary coded number and causing any zero bits in the zone fields thereof to assume a binary value of one and supplying the resulting number to a second input side of the binary arithmetic circuitry;

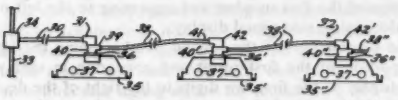
and third modifier circuitry coupled to the output side of the binary arithmetic circuitry for producing an output binary bit sequence wherein the bits in each zone field position therein have the proper zone code values.

4,001,571

LIGHTING SYSTEM

Myron D. Martin, Conyers, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed July 26, 1974, Ser. No. 492,252
Int. Cl.[2] F21S 7/00; H05B 33/02
U.S. Cl. 240—9 R 15 Claims



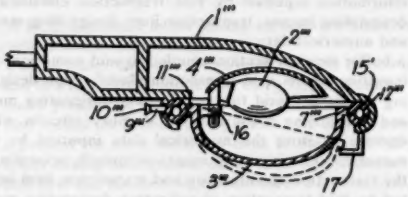
1. A system for lighting a floor area in a building comprising, in combination, a plurality of lighting fixtures supported by a ceiling structure to supply light to the floor area, each fixture having mounted thereon a plurality of lamps, at least one lighting circuit for energizing said lamps and a plural terminal first connector having terminal means wired to supply power to said lighting circuit, said fixtures being arranged into at least one branch circuit with a plurality of said fixtures in such branch circuit, a plurality of plural conductor branch circuit cable means, one branch circuit cable means connecting a plurality of circuits between each two adjacent fixtures in a branch circuit to distribute power to said fixtures, each branch circuit cable means having an end terminating in a second connector having first and second terminal means each connected to said plurality of conductors and an end terminating in a third connector having terminal means connected to said plurality of conductors, said first terminal means on a second connector on a cable means and said terminal means on a first connector on a fixture cooperating for connecting at least two of said conductors in such cable means to the lighting circuit in such fixture when such second and first connectors are connected together, said second terminal means on a second connector on a cable means and said terminal means on a third connector on another cable means cooperating for interconnecting corresponding conductors in such cable means when such second and third connectors are connected together, and means for applying electrical power between at least two of the cable conductors in each branch circuit.

4,001,572

DUSTPROOF AND AIRTIGHT LUMINAIRES

Marcel Stein, 560 Riverside Drive, New York, N.Y. 10027

Continuation of Ser. No. 468,891, May 10, 1974, abandoned.
This application Aug. 8, 1975, Ser. No. 603,197
Int. Cl.[2] F21S 1/10
U.S. Cl. 240—25 6 Claims



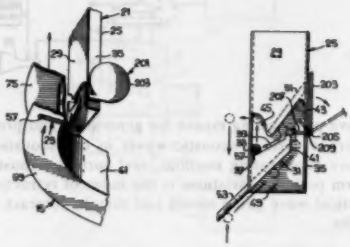
1. In a luminaire including a light-transmissive cover having a first peripheral edge and at least one of a reflector and a housing overlying said cover when in a closed configuration of said luminaire and defining therewith an enclosure for containing a fluid and an illumination source therein, one of said reflector and housing having a second peripheral edge conforming to the shape of said first peripheral edge, said illumination source having the characteristic of producing heat when actuated whereby the pressure of said fluid within said enclosure is increased, the improvement which comprises: an arcuate peripheral member extending from one of said reflector and said housing and spaced from and extending beyond said cover, said peripheral member and said edge overlapping to define a gasket-retaining space, and an inflatable hollow gasket received in said gasket-retaining space and extending around the perimeter of said cover, said gasket being effective when inflated to exert a substantially transverse force acting on said cover, said gasket thereby being effective to reduce the net transverse tension stresses in said cover and to create a substantially airtight seal between said cover and one of said reflector and housing.

4,001,573

LIGHTING POLE

Roger Derasp, 1825 Bules, Longueuil, Quebec, Canada

Filed Mar. 17, 1975, Ser. No. 559,304
Int. Cl.² F21V *21/38*
U.S. Cl. 240—64 **10 Claims**



1. A lighting structure comprising:
a. a pole;
b. a support means carried by the upper end of the pole;
c. a light-carrying structure encircling the pole;
d. a first fixed suspension means carried by the support means;
e. a second fixed suspension means carried by the light-carrying structure whereby the first and second fixed suspension means are interengageable to detachably suspend the light-carrying structure from the support means; and
f. cable means extending from the support means to the light-carrying structure for raising and lower the light-carrying structure on the pole whereby, prior to engagement of the first and second fixed suspension means, the cable means is circumferentially offset with respect to the first suspension means in order to provide a slight rotation of the light-carrying structure about the pole during the engagement and disengagement of the first and second suspension means with each other.

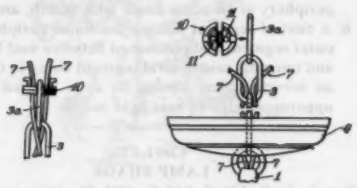
4,001,574

SUSPENSION FIXTURE

David H. Porter, and Douglas Bray, both of Fort Atkinson, Wis., assignors to Thomas Industries, Inc., Fort Atkinson, Wis.

Filed Sept. 12, 1975, Ser. No. 612,904
Int. Cl.² F21V *21/00*
U.S. Cl. 240—78 E **5 Claims**

1. For use with a ceiling outlet box having side walls and an open bottom and having diametrically disposed screw sockets on the inside of opposite side walls, a mounting strap having a downwardly extending laterally offset central portion including notches and integral lateral horizontal wings, said wings having mounting slots adapted to register with said screw sockets, screws cooperating with said slots in the wings and adapted to cooperate with the said screw sockets of the box for releasably mounting said strap on the open side of said box, said strap having upwardly extending end portions adapted to engage the ceiling outside the box, a suspension chain carrying a suspension fixture on the lower end of the chain and having a top oblong terminal link, a hanger, said chain being attached to the hanger at its upper end, said hanger having a restricted central portion embraced by the uppermost link of the suspension chain, and said hanger having one or more axially extending openings for conductor wires, conductor wires extending through said openings and extending along links of the chain to the suspended fixture, a



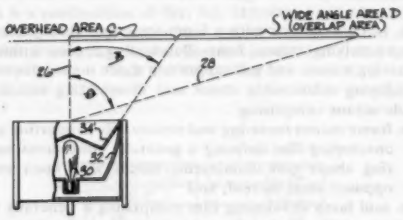
canopy having a central screw-threaded hole, said hanger being externally screw-threaded to engage the internal screw threads of the said canopy, and the hanger having at its upper end outwardly extending lugs adapted to be passed through the mounting strap and turned on its longitudinal axis to anchor it to said strap, the hanger having at its upper end wings which may be extended through said notches in the mounting strap and rotated out of register with said notches to hold the fixture in suspension.

4,001,575

LUMINAIRE AND LUMINAIRE ARRANGEMENT FOR LIGHTING THE CEILING WITHIN A ROOM

Daryl Dean Sullivan, and Herbert Arnold Odle, both of Newark, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed May 27, 1975, Ser. No. 581,329
Int. Cl.² F21V *7/09, 21/06*
U.S. Cl. 240—81 LD **16 Claims**



1. A luminaire for indirectly lighting a room by directly lighting the ceiling within said room, said luminaire comprising:
a. a housing located within said room below said ceiling and including an opening for the passage of light from within said housing, said opening facing substantially vertically upward in the direction of zenith;
b. means supporting said housing such that said opening faces the direction of zenith;
c. reflector means connected with and positioned within said housing;
d. refractor means connected with said housing and extending across and closing said opening;
e. a light source connected with and located within said housing, some of the light from said source passing directly to and through said refractor means extending across said opening and some of said light being reflected off of said reflector means and thereafter passing to and through said refractor means to said ceiling; and
f. said refractor means redirecting said light such that a

portion thereof passes therethrough in the direction of zenith and a portion at wide angles with zenith whereby to light areas on said ceiling directly above said housing and laterally spaced from said housing, said refractor means including

i. an outer circumferential segment including the outer periphery of said refractor means and an inner circumferential periphery in said housing and spaced from said light source, said outer circumferential segment extending inwardly from its outer periphery to its inner periphery at an acute angle with zenith, and

ii. a central segment joining the inner periphery of said outer segment and positioned between said light source and opening, said central segment being in the shape of an inverted cone having its apex located above the uppermost edge of said light source.

4,001,576

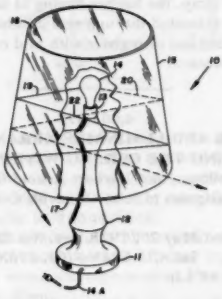
LAMP SHADE

Stephen A. A. Goddard, 616 E. 19th St., Minneapolis, Minn. 55404

Continuation of Ser. No. 448,936, March 7, 1974. This application Aug. 25, 1975, Ser. No. 607,208

Int. Cl.² F21V *1/00*

U.S. Cl. 240—108 B **6 Claims**



1. In combination with a lamp structure having a base, a lamp receiving means, lamp illuminating means within said receiving means, and self-supporting shade means disposed in enveloping relationship about said illuminating means, said shade means comprising:

a. frame means receiving and structurally supporting a lamp enveloping film defining a generally continuous annular ring about said illuminating means with open ends at opposed ends thereof; and

b. said lamp enveloping film comprising a generally transparent film having a semi-transparent reflective metallic coating adherently applied to at least one surface thereof and being characterized in that said coating is partially reflective and partially transparent to incident lamp radiation, with the metallic coating reflecting tungsten filament lamp radiation in a range of about 94% to 98% of total incident radiation, balance of from about 2% to 6% being transmitted through said lamp enveloping film.

4,001,577

METHOD AND APPARATUS FOR ACOUSTO-OPTICAL INTERACTIONS

Andres Albanese, Matawan, N.J., and Calvin F. Quate, Los Altos Hills, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Dec. 5, 1975, Ser. No. 637,947

Int. Cl.² G02F *1/33, 2/00*; **H04B** *9/00*

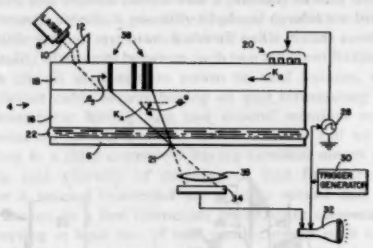
U.S. Cl. 250—199 **39 Claims**

1. Apparatus for interacting substantially coherent, monochromatic light with surface acoustic waves, comprising:

a. optical wave guide means for propagating light therein;

b. an acoustic surface wave propagating medium positioned such that surface acoustic waves propagated therein interact with the light in the optical wave guide means; and

c. chirp generator means connected to the acoustic surface



wave propagating means for generating and propagating chirped surface acoustic waves in the acoustic surface wave propagating medium, said surface acoustic waves form periodic variations in the index of refraction of the optical wave guide means and thereby interact with said light.

4,001,578

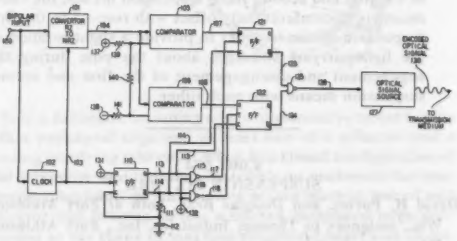
OPTICAL COMMUNICATION SYSTEM WITH BIPOLAR INPUT SIGNAL

John Stone Cook, Rumson, and Stewart David Personick, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 1, 1975, Ser. No. 601,049

Int. Cl.² H04B *9/00*

U.S. Cl. 250—199 **11 Claims**



1. An optical transmission system for use with a bipolar input signal having positive, zero, and negative voltage levels to represent logic states, said transmission system comprising an optical signal source having a control input which can be energized to produce a modulated optical signal, and means responsive to said bipolar signal for developing a binary signal at the control input of said optical signal source having two identical bits of one value to represent said positive level, two identical bits of the opposite value to represent said negative level, and a pair of opposite-valued bits to represent said zero level.

4,001,579

DEVICE FOR CONTROLLING COMPOSITE CIGARETTE FILTER RODS

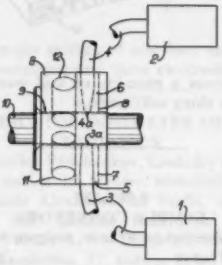
Jean-Pierre Lebet, Montreux, and Joel Ducommun, Chavannes, both of Switzerland, assignors to Baumgartner Papiers S.A., Switzerland

Filed Mar. 10, 1975, Ser. No. 557,028

Claims priority, application Switzerland, Mar. 13, 1974, 3484/74

Int. Cl.² G01D 21/04

U.S. Cl. 250—223 R 7 Claims



1. A control device for a filter manufacturing machine, comprising;

means for passing an elongate composite fiber rod along a path longitudinal of the rod;

a light source having a first elongate optical fiber bundle receiving light from the source to transmit the received light along the fibers from the source to and through a free end of the first bundle into the rod;

photo-detection means having a second elongate optical fiber bundle leading to the photo-detection means, from a free end of the second bundle receptive of incident light to transmit the incident light to the photo-detection means, the free end of the second bundle extending over a lesser width along said path than the free end of the first bundle thereby enabling detection of a clearer and greater amplitude light signal; and

means for holding the free ends of the first and second bundles adjacent said path, opposite one another, to direct said light from the source through the first bundle into and through an inside portion of the rod, and, as incident light from the composite rod and responsive to a composition of the inside portion thereof, into and through the second bundle and to the photo-detection means for actuating a controlled device in response to said composition.

4,001,580

SCINTILLATION SCANNER

Alfonso W. Mehrbrodt; Walter F. Mog, both of Brecksville, and Carl J. Brunnett, Willowick, all of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed June 3, 1971, Ser. No. 149,744

Int. Cl.² G01T 1/20

U.S. Cl. 250—363 S 13 Claims

1. A scintillation scanner comprising:

a. a housing and frame structure;

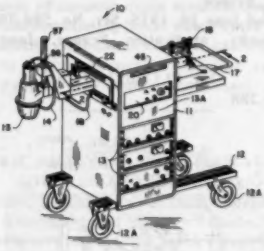
b. an imaging structure mounted on the housing and frame structure and including a scintillation-responsive signal emitting means;

c. a drive assembly interposed between said structures for driving said signal emitting means over an area to be studied;

d. media support means carried by one of said structures and adapted to carry an image producing media;

e. media stimulating means carried by the other of said structures and adapted to stimulate a media carried by said media support means in response to signals from said signal emitting means; and,

f. dead time correction means for shifting said media means relative to each other to compensate for relative move-



ment between said media means during the time delay between the time when a scintillation is received by said signal emitting means and the time when the media is caused to be stimulated by said media stimulating means.

4,001,581

DEVICE FOR DETECTING A MOVING OBJECT

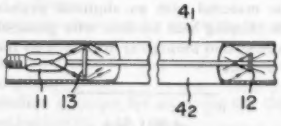
Shinji Murata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 493,854, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 351,999, April 17, 1973, abandoned. This application Mar. 10, 1976, Ser. No. 665,400

Claims priority, application Japan, Apr. 28, 1972, 47-50931

Int. Cl.² H01J 5/02

U.S. Cl. 250—239 19 Claims



1. A device for detecting the presence of a moving object comprising:

light source means disposed in the vicinity of a side of a transporting path of said object,

light receiving means disposed at an opposite side of said light source means with respect to said transporting path,

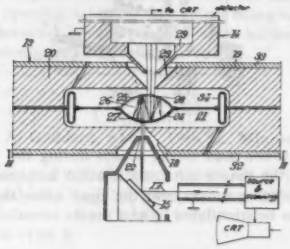
reflecting means disposed between said light source means and said light receiving means having facing and spaced apart reflecting surfaces to provide a straight-line light path connecting said light source means and said light receiving means, said object being transportable along the transporting path between the reflecting surfaces of said reflecting means, and

a non-transparent member disposed in said straight-line path for preventing the light of said light source means from directly reaching said light receiving means and permitting only the light repetitively reflected between the reflecting surfaces of said reflecting means to reach said light receiving means.

4,001,582
LOCAL SURFACE ANALYSIS

Raimond Castaing, Paris; Guy Blaise, Clichy, and Roger Quettier, Le Plessis-Robinson, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 20, 1975, Ser. No. 588,706
Claims priority, application France, June 28, 1974, 74.22722
Int. Cl.² H01J *37/26*
U.S. Cl. 250—288 **15 Claims**



1. A process for a local chemical analysis of a target sample, including the steps of sputtering particles from an elemental area of the surface of the target, subjecting the particles sputtered from said elementary area to successive adsorptions and desorptions on wall means heated to a high temperature for ionizing said particles with a probability independent of the nature of the target and dissociating said particles, and subjecting the ionized and dissociated particles to mass spectrometry analysis.

4,001,583
COVALENTLY BOUND BIOLOGICAL SUBSTANCES TO PLASTIC MATERIALS AND USE IN RADIOASSAY

M. James Barrett, Philadelphia, Pa., assignor to SmithKline Instrument, Inc., Sunnyvale, Calif.

Filed Oct. 4, 1974, Ser. No. 511,952
Int. Cl.² G01T *1/161*; G01N *31/00*
U.S. Cl. 250—303 **16 Claims**

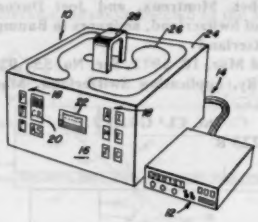
1. A method of covalently binding a biological substance to a plastic material which comprises reacting the inside surface of said plastic material with an aliphatic primary amine or diamine, then treating said surface with glutaraldehyde followed by coupling said biological substance to the glutaraldehyde treated surface.

4,001,584
AUTOMATIC SAMPLE CHANGER

Anthony A. Mueller, Florence; Frank W. Bao, Crestview Hills, and Stephen D. Parker, Erlanger, James L. Hummeldorf, Morningview, all of Ky., assignors to Actus, Inc., Florence, Ky.

Continuation of Ser. No. 504,743, Sept. 10, 1974, abandoned.
This application Oct. 29, 1975, Ser. No. 626,923
Int. Cl.² G01T *1/00*
U.S. Cl. 250—328 **35 Claims**

1. An automatic sample changer for transporting a plurality of test samples along a track, and for sequentially studying the characteristics of the samples being tested in a testing region remote from the track, the sample changer comprising: conveyor means for sequentially associating the samples with the testing region; a continuous elongated track which directly encounters said conveyor means at one location along its length; a plurality of independent transport means sequentially positioned along substantially the entire length of said track, each of which is adapted to associate with a sample; and indexing means for associating with said plurality of transport means to advance the samples associated therewith along said continuous track, said indexing means comprising a rotatable hub having a plurality of extensions thereon each of which

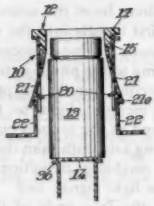


contacts and moves a plurality of said transport means at spaced locations along said track.

4,001,585
SAMPLE CONVEYORS

Yves Coutarel, Montrouge, France, assignor to Intertechnique S.A., Plaisir, France

Filed July 1, 1975, Ser. No. 592,328
Claims priority, application France, July 5, 1974, 74.23518
Int. Cl.² G01T *1/00*; B65G *65/00*
U.S. Cl. 250—328 **15 Claims**



12. A sample conveyor for an automatic radioactivity measuring system, comprising a plurality of cassette carriers, means for moving said carriers consecutively along a closed path passing at a transfer station, each carrier being constructed to receive a cassette having sample receiving locations distributed at equal intervals in a row, said carrier being constructed to receive a plurality of different types of cassettes having different spacings between said locations, all said spacings being multiples from each other, and said means for moving the carriers being constructed to optionally move said carriers past the transfer station with steps equal to anyone of said spacings.

4,001,586
THICK FILM SENSOR AND INFRARED DETECTOR

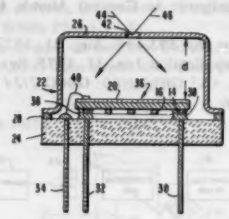
Anthony V. Fraioli, Setauket, N.Y., assignor to Plessey Incorporated, Melville, N.Y.

Filed May 9, 1975, Ser. No. 576,011
Int. Cl.² G01J *1/00*
U.S. Cl. 250—345 **17 Claims**

1. A temperature sensor comprising:
a self-supporting film of an oxidic material having a high temperature coefficient of resistance;
a pair of fired-on conductive electrodes in the form of closely-spaced, parallel interdigitated fingers on a first

major surface of said film;

a third electrode of low thermal mass substantially covering



the other major surface of said film; and

means for connecting said three electrodes into a circuit.

4,001,587

COLOR INDICATOR-DOSIMETER OF IONIZING RADIATION

Georgy Mitrofanovich Panchenkov, Leninsky prospekt, 67, kv. 133; Leonid Leonidovich Kozlov, Stoleshnikov pereulok, 9, kv. 18; Alexandr Alexandrovich Molin, ulitsa Molodezhnaya, 3, kv. 482; Zinaida Fedorovna Ershova, ulitsa Vavilova, 52, korpus 4, kv. 289; Lev Mikhailovich Mikhailov, ulitsa Raspletina, 17, korpus 2, kv. 49; Albert Genrikhovich Juzvyak, Teply stan, 2 miktroraion, korpus 27, kv. 252, all of Moscow; Rail Bakirovich Valitov, ulitsa Bljukhera, 18, kv. 7, Ufa; Vyacheslaw Petrovich Churov, ulitsa Zheleznodorozhnaya, 14, kv. 9, Stterlitamak, and Mikhail Petrovich Grinev, Leningradsky prospekt, 71, kv. 61, Moscow, all of U.S.S.R.

Filed Oct. 24, 1975, Ser. No. 625,513

Int. Cl.² G01N *5/00*

U.S. Cl. 250—474 **3 Claims**

1. A color indicator-dosimeter of ionizing radiation, comprising from 70 to 100 parts by weight of a thermoplastic polymer, from 10 to 40 parts by weight of a plasticizer, from 0.5 to 3.0 parts by weight of a stabilizer and two dyes compatible with said polymer, one of said dyes being incorporated in the color indicator-dosimeter to the extent of from 0.007 to 0.01 part by weight and having a G value of decolorization in said polymer of from 0.05 to 0.1 molecule/100 eV, with the absorption maximum thereof lying in the 450 to 590 nm spectral range, whereas the other of said two dyes is incorporated in the color indicator-dosimeter to the extent of from 0.015 to 0.03 part by weight and has a G value of decolorization in said polymer of from 0.15 to 1.5 molecule/100 eV, with the absorption maximum thereof lying in the 600 to 720 nm spectral range.

4,001,588

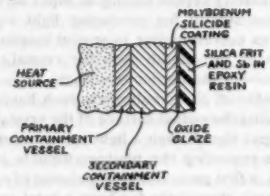
RADIOACTIVE HEAT SOURCE AND METHOD OF MAKING SAME

Norbert Bernard Elsner, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed July 17, 1975, Ser. No. 517,877

Int. Cl.² G21G *4/00*

U.S. Cl. 250—493 **13 Claims**



1. A radioactive source of heat which is suitable for use as a part of a nuclear battery for implantation in a human being, which source comprises

a radioactive isotope,

a containment vessel encapsulating said isotope and having sufficient strength to contain any gaseous products of radioactive decay,

a high-temperature-resistant diffusion coating layer which is formed predominantly of refractory metal silicides disposed exterior of said containment vessel, and

an outer layer of ceramic oxide material disposed exterior of said diffusion coating layer, which outer layer provides a substantially continuous ceramic oxide layer upon exposure to high-temperature oxidizing conditions and thereby protects said containment vessel.

4,001,589

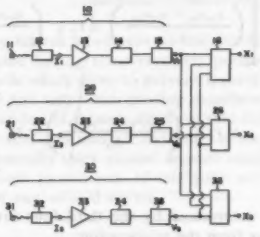
RADIOMETRIC ANALYZER WITH PLURAL RADIATION SOURCES AND DETECTORS

Sumitaro Arima, Sendai; Minoru Oda, Amagasaki; Kyoichi Miyashita, Amagasaki, and Mamoru Takada, Amagasaki, all of Japan, assignors to Tohoku Electric Power Company, Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 432,235, Jan. 10, 1974. This application Apr. 17, 1975, Ser. No. 569,143

Int. Cl.² G01T *1/16*

U.S. Cl. 250—336 **2 Claims**



1. A radiometric analyzer for measuring the masses per unit volume X1, X2, and X3 of a material by radiation comprising:

a first radiation source for bombarding the material with a first radiation;

a first radiation detector for receiving the first radiation after bombardment with respect to the material;

a second radiation source for bombarding the material with a second radiation;

a second radiation detector for receiving the second radiation after bombardment with respect to the material;

a third radiation source for bombarding the material with a third radiation;

a third radiation detector for receiving the third radiation after bombardment;

a first linear calibration circuit connected to receive the output of the first radiation detector for generating an output signal V1;

a second linear calibration circuit connected to receive the output of the second radiation detector for generating an output signal V2;

a third linear calibration circuit connected to receive the output of the third radiation detector for generating an output signal V3;

a first four fundamental rules operator for generating an output indicative of X1;

a second four fundamental rules operator for generating an output indicative of X2;

a third four fundamental rules operator for generating an output indicator of X3;

means connecting the output signal V1 of the first linear calibration circuit to the inputs of the first, second and third four fundamental rules operators;

means connecting the output signal V2 of the second linear calibration circuit to the inputs of the first, second and third four fundamental rules operators;

means connecting the output signal V3 of the third linear calibration circuit to the inputs of the first, second and third four fundamental rules operators;

X1 being determined by the first four fundamental rules operator from the relationship:

$$X_1 = \frac{1}{\Delta}\left[\left(\frac{a_{22}a_{33} - a_{23}a_{32}}{K_1}\right) \times V_1 - \left(\frac{a_{12}a_{33} - a_{32}a_{13}}{K_2}\right) \times V_2 + \left(\frac{a_{12}a_{23} - a_{22}a_{13}}{K_3}\right) \times V_3\right]$$

X_2 being determined by the second four fundamental rules operator from the relationship:

$$X_2 = \frac{1}{\Delta}\left[\left(\frac{a_{21}a_{33} - a_{31}a_{23}}{K_1}\right) \times V_1 + \left(\frac{a_{11}a_{33} - a_{31}a_{13}}{K_2}\right) \times V_2 + \left(\frac{a_{11}a_{23} - a_{21}a_{13}}{K_3}\right) \times V_3\right]$$

X_3 being determined by the third four fundamental rules operator from the relationship:

$$X_3 = \frac{1}{\Delta}\left[\left(\frac{a_{21}a_{32} - a_{31}a_{22}}{K_1}\right) \times V_1 + \left(\frac{a_{11}a_{32} - a_{31}a_{12}}{K_2}\right) \times V_2 + \left(\frac{a_{11}a_{22} - a_{21}a_{12}}{K_3}\right) \times V_3\right]$$

wherein

$$\triangle = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$$

wherein a_{11}, a_{12}, a_{13}, a_{21}, a_{22}, a_{23}, a_{31}, a_{32} and a_{33} and K_1, K_2 and K_3 are constants and

wherein V_1, V_2 and V_3 are defined as follows:

$$V_1 = K_1(a_{11}X_1 + a_{12}X_2 + a_{13}X_3)$$
$$V_2 = K_2(a_{21}X_1 + a_{22}X_2 + a_{23}X_3)$$
$$V_3 = K_3(a_{31}X_1 + a_{32}X_2 + a_{33}X_3).$$

4,001,590

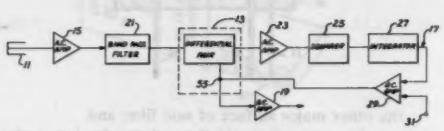
RADIATION FLUX MEASURING DEVICE

Ernesto Corte, La Jolla, Calif., and Pradeep Maitra, New Delhi, India, assignors to General Atomic Company, San Diego, Calif.

Division of Ser. No. 393,444, Aug. 31, 1973, Pat. No. 3,916,193. This application Jan. 31, 1975, Ser. No. 545,973

Int. Cl.² G01J 1/00; G06G 7/24

U.S. Cl. 250—336 **3 Claims**



1. A radiation flux measuring device comprising, a radiation detector for producing an output having an a-c component representing radiation flux, a differential pair of transistors having a first input to one of said transistors, a second input to both of said transistors, and an output at the other of said transistors, means for applying the output of said radiation detector to said second input of said differential pair, a feedback loop connected from said output of said differential pair to said first input thereof for maintaining the output of said differential pair constant, said feedback loop including squaring and integrating means, and means for providing an output representing the signal at first said input.

4,001,591

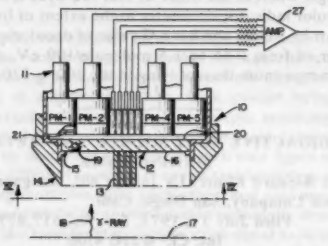
SCINTILLATION CAMERA AND HEAD THEREFOR HAVING MEANS FOR IMPROVING RESOLUTION OVER A LIMITED FIELD OF VIEW

Dan Inbar, Haifa, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed July 11, 1975, Ser. No. 595,163

Int. Cl.² G01T 1/20; G02B 5/00

U.S. Cl. 250—363 S **17 Claims**



1. A head for a scintillation camera comprising:

a. a scintillating crystal having an input surface exposed to radiation stimuli for producing light events at spatial locations corresponding to spatial locations of the interactions of the stimuli with the crystal, and an output surface opposite the input surface;

b. a plurality of photomultipliers each having a photocathode facing the output surface of the crystal and producing an output signal when a light event occurs; and

c. means mounting the photomultipliers in two different groups, a first group forming a cluster of n_1 photomultipliers whose photocathodes have a total area of A_1, and a second group forming an array of n_2 photomultipliers whose photocathodes have a total area A_2 wherein n_1/A_1 is greater than n_2/A_2.

4,001,592

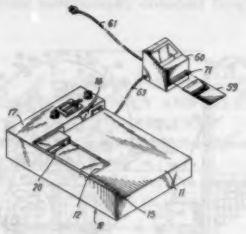
FILM IDENTIFICATION APPARATUS

Seymour Katz, Glen Cove, and Victor R. Brown, West Hempstead, both of N.Y., assignors to IPCO Hospital Supply Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 565,583, April 7, 1975, Pat. No. 3,959,657. This application Jan. 28, 1976, Ser. No. 653,127

Int. Cl.² G03B 41/16

U.S. Cl. 250—476 11 Claims



4. Apparatus for placing identifying indicia on film within a cassette, the apparatus comprising, in combination:

a cassette supporting member;

an electroluminescent panel carried by the supporting member, the panel having a protruding tab portion in position to extend within a cassette received by said member;

indicia means removably disposed on the protruding tab portion of the electroluminescent panel;

a control circuit connected to the electroluminescent panel for energizing said panel, to illuminate the same and thereby expose the film within the cassette with the information on the indicia means; and

indicia applying means electrically connected to the control circuit for imprinting information on said indicia means, said indicia applying means including an opening for receiving said indicia means, and means automatically responsive to the receipt of said indicia means in said opening for simultaneously applying said information thereto and activating said control circuit to condition the same for the energization of said panel.

4,001,593

AXIAL TOMOGRAPHIC SCANNER HAVING MEANS FOR SUPPORTING X-RAY SOURCE CABLES

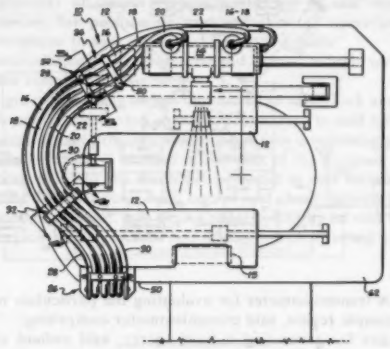
James C. Wing, Los Altos, and Jack V. White, Los Gatos, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 20, 1975, Ser. No. 623,848

Int. Cl.² A47B 3/10; A45F 3/00; H05G 1/10

U.S. Cl. 250—522 10 Claims

5. An axial tomographic scanner comprising axial tomographic means for collecting a plurality of sets of data corresponding to the transmission or absorption of a plurality of beams of penetrating radiation through a planar slice of an object being analyzed including means to locate an object to be analyzed, source and detector means mounted on a yoke for directing one or more beams of penetrating radiation through the object from said source to said detector means, said source having a plurality of flexible cables connected thereto, means to rotate said yoke and said source and said detector means mounted thereon about the object whereby a plurality of sets of data corresponding to the transmission or absorption of the object of the plurality of beams of penetrating radiation are collected, and means for supporting a plurality of flexible cables leading to said source, said cable supporting means comprising first bracket means mounted on said yoke adjacent said source for restraining cable movement, second bracket means mounted on said yoke remote from said source for restraining cable movement, and means disposed between said first and said second bracket means for maintaining said cables passing therethrough in a gradual arc while preventing undue flexing of said cables, said cable maintaining means comprising a pair of flexible elongated bands extending on opposite lateral sides of those portions of said flexible cables extending from said first bracket means to said second bracket means and a cable guide, one lateral end of said cable guide securely engaging one of said bands and the other lateral end of said cable guide surrounding a portion of said other



band whereby lateral movement of said bands is restrained, said cable guide having transverse side portions connecting said lateral ends which serve to prevent transverse movement of said cables and said bands passing therebetween, whereby said pair of bands and those portions of said cables extending between said first and said second bracket means are maintained in a generally thick planar, arcuate configuration during all rotational movements of said yoke and translational movements, if any, of said source.

4,001,594

METHOD FOR CONTROLLING THE QUANTITY OF EXPOSURE IN PHOTOGRAPHIC PRINTING

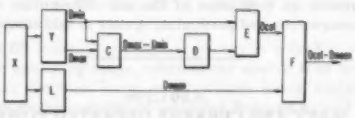
Taizo Akimoto; Takaaki Terasita, and Shigeru Watanabe, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 20, 1975, Ser. No. 588,984

Claims priority, application Japan, June 21, 1974, 49-71636

Int. Cl.² G01N 21/30

U.S. Cl. 250—559 4 Claims



1. In a method for measuring the transmission density of a negative film to generate a control signal for controlling the quantity of exposure in photographic printing, the method for controlling the quantity of exposure in photographic printing comprising the steps of:

photoelectrically detecting a plurality of optical densities in a principal portion of the negative film,

discriminating among the photoelectrically detected optical densities the maximum value and the minimum value of the optical density,

calculating the difference between said maximum value and said minimum value,

non-linearly converting said calculated difference, and

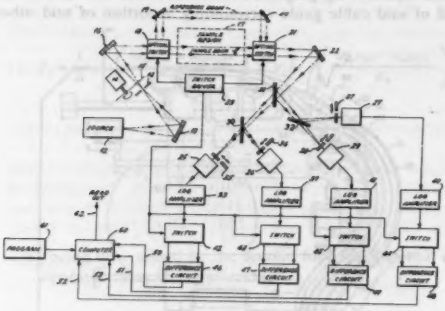
adding the non-linear conversion of said calculated difference and the discriminated minimum value to control the quantity of printing exposure.

4,001,595

MULTIPLE WAVELENGTH TRANSMISSOMETER

Elias Reisman, Orange, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Apr. 23, 1975, Ser. No. 570,603
Int. Cl.² G01N 21/26, 15/02
U.S. Cl. 250—575 5 Claims



1. A transmissometer for evaluating the particulate matter in a sample region, said transmissometer comprising:

means for generating radiant energy, said radiant energy characterized as having substantial energy content in at least a plurality of wavelengths extending over a broad portion of the spectrum,

means for forming said radiant energy into a beam,

means for passing said beam through said sample region, said beam being selectively attenuated at different ones of said wavelengths as a function of the quantity, nature, and size of the particles present in the portion of the sample region traversed by said beam,

a plurality of radiant energy detectors,

means for illuminating said plurality of radiant energy detectors from the beam emerging from said sample region,

means associated with each detector in said plurality for limiting the spectral response of said detector to a narrow portion of said spectrum, each detector being limited to a different portion of said spectrum,

means for establishing a plurality of sets of values, each set being representative of the predicted amplitude of signals derived from the outputs of said detectors for a selected size distribution and mass concentration of particulate matter in said sample region, and

means for comparing signals derived from the outputs of said detectors with selected ones of said sets, thereby to provide an indication of the size distribution and mass concentration of particulate matter in said sample region.

4,001,596

WAVE AND CURRENT OPERATED POWER GENERATING DEVICE

Earl D. Kurtzbein, 711 W. 46th St., Vancouver, Wash. 98663

Filed Oct. 3, 1974, Ser. No. 511,772
Int. Cl.² F03B 13/12
U.S. Cl. 290—53 3 Claims

1. A wave and current power generating device, comprising:

a. a pair of elongated hollow hulls connected together in laterally spaced, parallel relation, said hulls including compartments arranged to be filled with air to float the hulls and to be filled with water to sumberge the hulls,

b. pump means on one of the hulls communicating with the hull compartments for filling the latter selectively with air and with water,

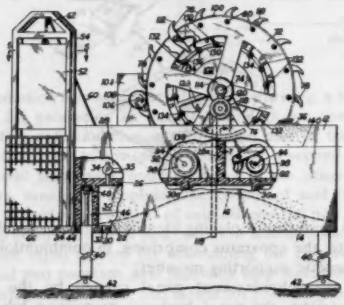
c. a floor extending between said hulls below the top thereof forming an open top water passageway therebetween having inlet and outlet ends,

d. a water wheel cupported for rotation on said hulls with a portion of the water wheel projecting into said water passageway between said inlet and outlet ends, said water wheel comprising

1. a pair of upstanding circular wheel members spaced apart laterally and extending into said water passageway adjacent the inner sides of the hulls, and

2. vanes extending transversely between said wheel members for rotating the latter under the influence of water moving through said passageway,

outwardly projecting gear teeth on the outer periphery of at least one of said circular wheel members,



f. electric generator means mounted on the hull adjacent said peripheral gear teeth,

g. gear means on said generator means meshing with the gear teeth on the periphery of said circular wheel member, and

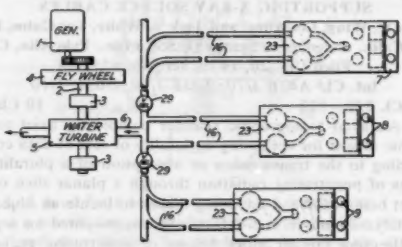
h. a plurality of vertically extensible legs on the hulls extending adjustably below the latter for support on a submerged surface, for adjusting the depth of the floor of the water passageway between the hulls relative to the water level.

4,001,597

ELECTRIC POWER GENERATING SYSTEM

Albert L. Graff, 32 Wilson St., Pittsburgh, Pa. 15223

Filed June 20, 1975, Ser. No. 588,804
Int. Cl.² F03B 13/12
U.S. Cl. 290—53 5 Claims



1. An electric power generating system comprising an electric generator, a turbine operatively connected with the generator for driving it and having an inlet, a plurality of base members seated on an ocean bed adjacent the shore and having shore ends and off-shore ends, normally expanded upright compression cylinders mounted on the shore ends of said base members, each cylinder having a fluid inlet and an outlet, check valves for the cylinder inlets and outlets to direct flow of fluid through the cylinders in only one direction, conduits connecting the cylinder outlets with said turbine inlet, rigid pressure plates above said base members and the cylin-

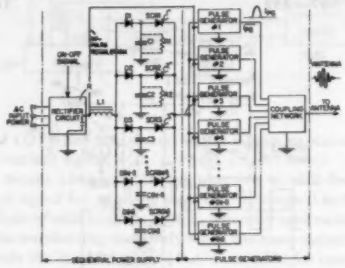
ders thereon and inclined downwardly from their shore ends to their opposite ends, means hinging the lower end of each pressure plate to the underlying base member on a horizontal axis, whereby waves passing over the pressure plates will force their upper ends down to compress the cylinders to force fluid through said conduits to said turbine, and means including a coil spring inside each cylinder for expanding it and raising the overlying pressure plate after each wave has passed over them, said base members being located in such positions on the ocean bed that said pressure plates will be depressed in succession to provide substantially constant flow of fluid to the turbine.

4,001,598

SEQUENTIAL POWER SUPPLY AND METHOD FOR RF PULSE GENERATION

Paul R. Johannessen, Lexington, Mass., assignor to Megapulse Incorporated, Bedford, Mass.

Filed Dec. 29, 1975, Ser. No. 644,623
Int. Cl.² H03K *3/00*
U.S. Cl. 307—106 **16 Claims**



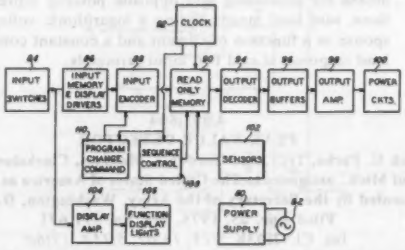
1. A method of RF pulse generation, that comprises, charging a plurality of energy storage sources; sequentially discharging the sources to provide successive energy bursts; simultaneously transferring the energy of each burst to a further plurality of energy storage sources; and, following such transfer, sequentially discharging the further energy storage sources and generating successive cycles of an overall RF pulse corresponding to each burst.

4,001,599

APPLIANCE PROGRAMMER WITH INTEGRATED CIRCUIT

Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 17, 1974, Ser. No. 506,838
Int. Cl.² H01H *7/00*, *43/00*
U.S. Cl. 307—141 **8 Claims**



1. In an appliance which performs a plurality of operations, an electronic control for stepping the appliance through an operating program which comprises a sequence of the operations, said electronic control comprising:

a clock having a plurality of outputs for supplying electrical timing pulses at a plurality of discrete intervals;

a sequence control connected to said clock for establishing a sequence of operations, the timing of said operations being controlled by selected timing pulses;

a memory circuit connected to said sequence control and to said clock for generating a sequence of output signals;

a plurality of output circuits connected to said memory circuit for performing said sequence of operations in response to said sequence of output signals;

a source of reference potential and at least a single terminal for connection thereto;

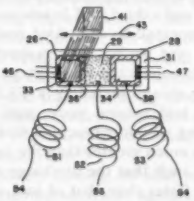
program modifying means connected to said clock and said terminal and having an output connected to said memory circuit, said program modifying means comprising gating means which is enabled at the start of the program to be responsive to the electrical potential at said terminal to pass a timing pulse from one of said clock outputs to the memory circuit, said timing pulse operating on said memory circuit in place of one of said selected timing pulses.

4,001,600

INTERCONNECTING CIRCUIT FOR EBS DIODES AND METHOD

Philip S. Carter, Jr., Palo Alto, Calif., assignor to Watkins-Johnson Company, Palo Alto, Calif.

Filed June 2, 1975, Ser. No. 582,621
Int. Cl.² H01J *23/16*
U.S. Cl. 307—149 **12 Claims**

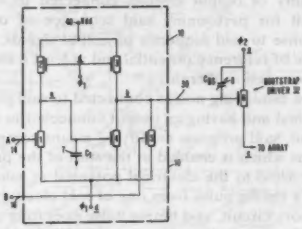


1. An EBS source, for coupling energy to a load at a radio frequency operating range, wherein the source is of the type utilizing an electron beam to illuminate beam surfaces of plural EBS diodes capable of assuming first and second states in response to said excitation comprising electron beam means for alternatively illuminating said diodes in a predetermined manner, first and second EBS diodes arrayed to receive said beams, said diodes being electrically series connected in phase at said operating frequency range, said diodes each having a radio frequency generating state when illuminated and a back-biased state including a finite capacitance thereacross when non-illuminated, load coupling means connected across said series connected diode combination, a power supply, isolation means connected between said diode combination and said supply for providing voltage and current to each diode and providing isolation between said diodes and between said diodes and said supply at said operating frequency range, so that when said first diode is illuminated the radio frequency energy generated is coupled via the finite capacitance of the second diode to said load, and when said second diode is illuminated the radio frequency energy generated is coupled via the finite capacitance of the first diode to said load.

4,001,601
TWO BIT PARTITIONING CIRCUIT FOR A DYNAMIC, PROGRAMMED LOGIC ARRAY

Stanley Everett Schuster, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,734
Int. Cl.² H03K *19/08, 19/34, 17/10, 17/56*
U.S. Cl. 307—205 **9 Claims**



1. An input decoder for a two-bit partitioning circuit of a programmed logic array, comprising:

a first stage including two field effect transistors (FETs) having a respective first one of their electrode terminals connected to a common first node, and a first capacitive means including a capacitor having one side connected to said first node, with the gate of a first FET in said first stage being connected to a first primary input line to the two-bit partitioning circuit;

a second stage including three FETs, each having a first one of their electrode terminals connected to a common second node, a first of said three FETs having its gate connected to said first node and its second electrode terminal connected to a third node together with both a second electrode terminal of said first FET in said first stage and a second electrode terminal of a second FET in said second stage, said second FET in said second stage having its gate connected to a second primary input line to the two-bit partitioning circuit, and the second FET in said first stage and a third FET in said second stage having their gates connected to said third node for receiving a phase voltage and having their respective second electrode terminals connected to a voltage source; and

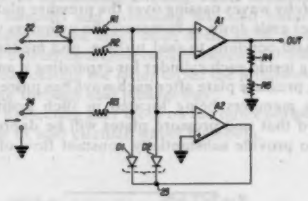
bootstrap driver means including a FET having its gate connected to said second node, said bootstrap driver means including second capacitive means with a capacitance which is much greater than the capacitance of said first capacitor such that the discharge speed of said first stage is much faster than that of said second stage, said FET of said bootstrap driver means providing one of four outputs of said two-bit partitioning circuit: whereby a signal is caused to propagate through the two stages in one clock cycle, with the only power dissipation being essentially that required to charge the two capacitive means.

4,001,602
ELECTRONIC ANALOG DIVIDER

Arthur G. Birchenough, Brookpark, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 24, 1975, Ser. No. 598,968
Int. Cl.² G06G *7/12, 7/16*
U.S. Cl. 307—229 **8 Claims**

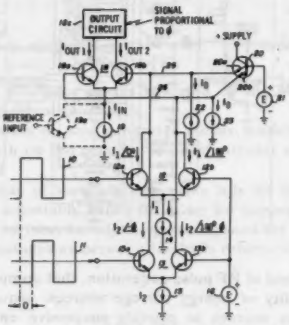
1. A divider circuit comprising a pair of resistors, a pair of diodes, each resistor being connected in series with a corresponding diode and the two series circuits thereby formed being connected in parallel, the resistors connected to form one junction of the parallel circuits, means for applying to said one junction a current proportional to a desired denominator in the exponential voltage-current characteristic of the diode, whereby the current through the diodes is proportional to said denominator, means for applying to one of said diodes an incremental current proportional to a desired numerator, and an amplifier, one input to said amplifier comprising the connection between said other diode and its corresponding resistor, the output of said amplifier being connected to the diode junction of said parallel circuits, and the other amplifier input being connected to a common terminal.



4,001,603
EMITTER LOAD SWITCHING CIRCUIT

Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 25, 1976, Ser. No. 661,103
Int. Cl.² H03K *5/20;* **H03B** *3/04*
U.S. Cl. 307—232 **10 Claims**



1. A circuit for responding to a plurality of square waveform signals of differing phase to obtain a signal having phase information representative of the combined signals, said circuit comprising:

means for accomodating a first signal input and a second signal input, each of said signal inputs being of approximately square wave form and having a particular phase,

means for providing opposite polarity representations of at least one of said first and second input signals,

means for processing said opposite polarity representations to derive an output that has information representative of the combined input signal phases, said means for processing having at least one output terminal and two input terminals, and

load means coupled to said two input terminals of said means for processing said opposite polarity representations, said load means having a logarithmic voltage response as a function of current and a constant combined load response at said two input terminals.

4,001,604
PEAK VALUE DETECTOR

Jack G. Parks, Troy, and Gordon J. McInnes, Clarkston, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

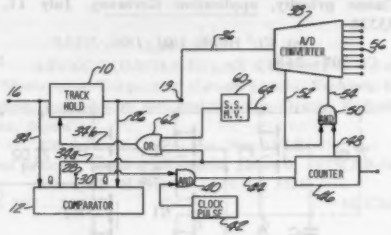
Filed Apr. 25, 1975, Ser. No. 571,671
Int. Cl.² H03K *5/13, 13/02, 5/153, 17/60*
U.S. Cl. 307—235 A **5 Claims**

1. A circuit for detecting peaks in a time-variant analog signal and converting same to digital form, comprising:

a track-hold unit having an input (16) adapted to receive

the time-variant signal, a signal storage means (18), a bistable gated switch (14), having a gate terminal, for alternately conducting the time-variant signal to the storage means or isolating the storage means from the time-variant signal, and output terminal (19) continuously connected to the storage means for delivering the stored signal;

a comparator for comparing the time-variant signal and stored signal, said comparator having a first input terminal (24) connected to said track-hold unit input terminal (16), a second input terminal (26) connected to said track-hold unit output terminal (19), a first output terminal producing a first logic output signal (Q) when the time-variant signal exceeds the stored signal, and producing at a second output terminal a second logic output



signal ($\overline{Q}$) when the stored signal equals or exceeds the time-variant signal;

circuit means (34*a* and 34*b*) responsive to said first logic output signal for applying said first logic signal to the gate terminal of said bistable switch, whereby said switch (14) is in its conducting state only when the time-variant signal exceeds the stored signal; a converter (38) for converting the stored time-variant signal at said track-hold unit output (19) to digital form; said converter having convert-control circuitry (50, 52, 54);

an additional circuit means (44 and 48) coupled to said comparator second output terminal for applying said second logic output signal ($\overline{Q}$) to said convert control circuitry whereby the converter is put into the convert mode only when the stored signal equals or exceeds the time-variant signal.

4,001,605

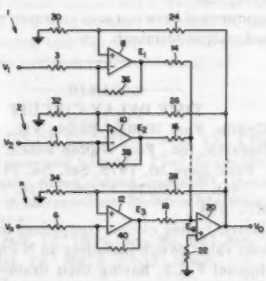
VOTER CIRCUIT INCLUDING AVERAGING MEANS

Francis J. Thomas, West Paterson; Albert Kirchhein, Montvale, and Donald J. Porawski, Bayonne, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sept. 29, 1975, Ser. No. 617,548

Int. Cl.² H03K *5/20;* **G06G** *7/12*

U.S. Cl. 307—235 F **9 Claims**



1. Apparatus voting on a plurality of input signals for providing an output signal, comprising:

a plurality of amplifier means, each of which receives one of the plurality of input signals at a first input terminal and provides an output signal at an output terminal;

other amplifier means connected at a first input terminal to the output terminal of each of the plurality of amplifier means and connected at an output terminal to a second input terminal of each of the plurality of amplifier means, and voting on the plurality of input signals for providing the output signal at said output terminal; and

means connected to the output terminals of each of the plurality of amplifier means and to the first input terminal of each of the plurality of amplifier means for averaging the plurality of input signals over a predetermined range, with the voting occurring outside of said range.

4,001,606

ELECTRICAL CIRCUIT

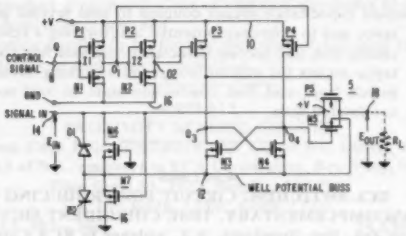
Andrew Gordon Francis Dingwall, 208 Riverview Drive, Somerville, N.J. 08876

Filed June 3, 1975, Ser. No. 583,285

Claims priority, application United Kingdom, June 5, 1974, 24900/74

Int. Cl.² H03K *17/60, 17/06, 17/30, 3/286*

U.S. Cl. 307—251 **18 Claims**



1. An electrical circuit including:

a signal input point and a signal output point;

a transistor having first and second electrodes defining the ends of a conduction path and a control electrode; said first electrode being connected to said signal input point, and said second electrode being connected to said signal output point; said transistor being turned on in response to a signal applied between its control electrode and said first electrode of given relative polarity and greater than a given amplitude; and

means for selectively turning off said transistor including means connected between said signal input point and said control electrode and responsive to values of the input signal of a sense and amplitude tending to turn the transistor on for applying a signal of the same sense to the control electrode of said transistor and of an amplitude such as to overcome said tendency whereby said transistor is maintained in a non-conducting condition.

4,001,607

DRIVE CIRCUIT FOR A GATE SEMICONDUCTOR DEVICE

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 585,209

Int. Cl.² H03K *17/72;* **H01J** *29/76*

U.S. Cl. 307—252 C **3 Claims**

1. A drive circuit for a gated semiconductor device, comprising:

a source of direct current potential;

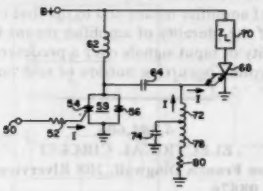
switching means for providing first and second conduction states;

a gated semiconductor device;

first capacitance means coupled to said switching means

and a gate electrode of said gated semiconductor device for providing a first gate current in response to said first conduction state;

a first inductance means coupled to said source of direct current potential and said switching means for storing energy during said first conduction state to be utilized to enhance a second gate current and the replenishment of energy in said first capacitance means during said second conduction state;



means including a second inductance coupled to said gate electrode and reference potential for storing energy during said first conduction state to be utilized to further enhance said second gate current during said second conduction state; and

second capacitance means coupled to said second inductance and to reference potential and forming a resonant circuit with said second inductance and said first capacitance means for commutating said switching means to switch from said first conduction state to said second conduction state.

4,001,608

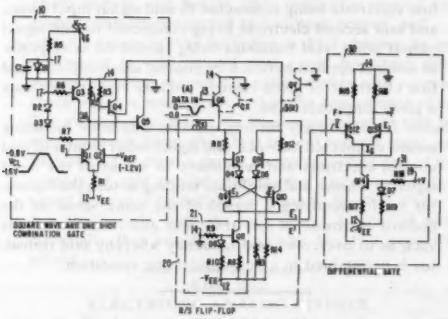
ECL SWITCHING CIRCUIT FOR PRODUCING NONCOMPLEMENTARY, TIME COINCIDENT SIGNALS

Borys Zuk, New Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,608

Int. Cl.² H03K *17/00*

U.S. Cl. 307—268 **9 Claims**



1. In combination with a differential stage having first and second inputs and first and second outputs, the improvement comprising;

means for producing a relatively short width pulse at said first output when its potential makes a transition from a first to a second level and the potential at the second output makes a transition from said second level to said first level including:

a. a first means having a control electrode and having a conduction path connected between said first output and a point of fixed potential for reestablishing said first level at said first output when said conduction path is conductive;

b. a delay network, coupled to the control electrode of said first means, for delaying the turn on of said conduction path until a set time after said delay network is enabled; and

c. clamp means coupled between said second output and said delay network for disabling said delay network and preventing conduction through said conduction path when the potential at said second output is at said second level and for enabling said delay network when the second output is at said first level.

4,001,609

CMOS POWER-ON RESET CIRCUIT

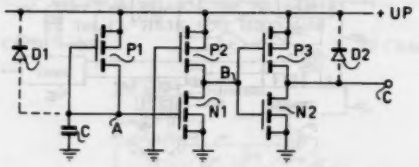
Klaus Sickert, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,704

Claims priority, application Germany, July 11, 1974, 2433328

Int. Cl.² H03K *5/01, 1/00, 5/153*

U.S. Cl. 307—268 **1 Claim**



1. An automatic reset circuit, comprising

a common power supply line;

an output terminal;

a first enhancement mode p-type MOSFET having a first electrode connected to said common power supply line, a second electrode, and a gate connected to said second electrode of said first MOSFET;

a second enhancement mode p-type MOSFET having a first electrode connected to said common power supply line, a second electrode, and a gate connected to ground;

a third enhancement mode p-type MOSFET having a first electrode connected to said common power supply line, a second electrode, and a gate connected to said second electrode of said second MOSFET;

a fourth enhancement mode n-type MOSFET having a first electrode connected to said second electrode of said second MOSFET, a second electrode connected to ground, and a gate connected to said gate of said first MOSFET;

a fifth enhancement mode n-type MOSFET having a first electrode connected to said second electrode of said third MOSFET and to said output terminal for providing a predetermined voltage level upon activation of said common power supply line, a second electrode connected to ground, and a gate connected to said gate of said third MOSFET; and

a diode connected between said common power supply line and said output terminal.

4,001,610

TIME DELAY CIRCUIT

Floyd S. Griffin, Fort Walton Beach, Fla., assignor to Ordnance Research, Inc., Fort Walton Beach, Fla.

Filed June 30, 1975, Ser. No. 592,025

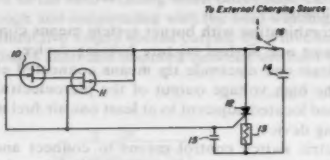
Int. Cl.² H03K *17/26, 17/56, 5/13*

U.S. Cl. 307—293 **7 Claims**

1. An electric timing circuit comprising in combination:

a threshold value switch including an N-channel F.E.T. and a P-channel F.E.T. having their drain-source path connected in series, the gate electrodes of each connected to the drain of the other and their source electrodes connected together;

a voltage sensitive element;
a self contained voltage source; and



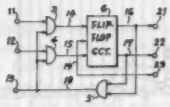
means connecting said source, said element and the drain-source path of said F.E.T.s in a series circuit.

4,001,611

ASYNCHRONOUS DELAY CIRCUIT

Tatsuo Maruyama, Tokyo, and Hiroshi Sasaki, Kashiwa, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Jan. 8, 1976, Ser. No. 647,584
Claims priority, application Japan, Jan. 10, 1975, 50-5000
Int. Cl.² H03K *5/13, 19/34, 3/29*
U.S. Cl. 307—293 **10 Claims**



1. An asynchronous delay circuit comprising:
a flip-flop circuit having two input terminals, two output terminals and a control terminal;
two input information terminals for receiving two logical inputs;
two gates respectively connected between said two input information terminals and the two input terminals of said flip-flop circuit;
first control means connected to the output terminals of said flip-flop circuit and said two gates for applying the two logical inputs to the two input terminals of the flip-flop circuit through said two gates to store the logical inputs in the flip-flop circuit only when the flip-flop circuit is previously established to an empty state where logical values of the two outputs of said flip-flop circuit are coincident with each other;
control terminal means for receiving an external control signal; and
second control means connected between said control terminal means and said control terminal of said flip-flop circuit for forcing said flip-flop circuit to said empty state in response to said external control signal.

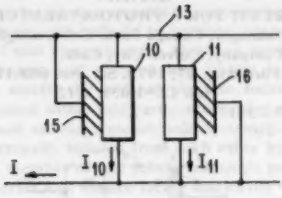
4,001,612

LINEAR RESISTANCE ELEMENT FOR LSI CIRCUITRY

Takaaki Aoki, Kanagawa, Japan; Paul Evrenidis, Raleigh, N.C.; Ryo Igarashi, Shiga, Japan, and Seiki Ogura, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,469
Int. Cl.² H01L *27/02, 29/66*
U.S. Cl. 307—304 **2 Claims**

1. A constant resistance integrated circuit configuration for a semi-conductor chip, said circuit comprising:
two substantially similar depletion mode field effect transistors, each having a source and a drain electrode connected by a conductive region;
a conductive area on said chip connected to said drain electrodes of both said transistors to form a drain connection;
a second conductive area on said chip connected to said source electrodes of both said transistors to form a source connection;



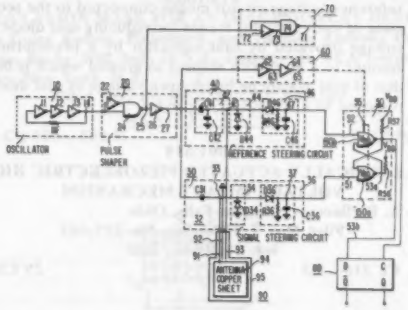
a pair of gate electrodes, each forming a part of one of said transistors with each gate electrode adjacent to and insulated from an associated one of said conductive regions to control the flow of current therein;
a conductor connecting one of said gate electrodes to said drain connection; and
another conductor connecting the other of said gate electrodes to said source connection.

4,001,613

PROXIMITY SENSING CIRCUIT

Vernon Elton Hills, Hightstown, and Leesui Wu, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,780
Int. Cl.² H03K *17/00;* **G08B** *13/00*
U.S. Cl. 307—308 **14 Claims**



1. The combination comprising:
a first terminal for the application thereto of sampling signals;
first and second circuits, each circuit having an input connected to said first terminal and an output;
a sensor responsive to external stimuli connected to said first circuit for varying the response of the first circuit to said sampling signals; and
comparator means connected to the outputs of said first and second circuits for comparing the output signals produced at the outputs of said first and second circuits;
said comparator means including a regenerative circuit having at least two input terminals, an output terminal, and two power terminals for the application therebetween of an operating potential; one of said two input terminals being connected to the output of said first circuit and the other one of said two input terminals being connected to the output of said second circuit; and

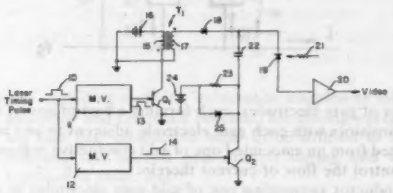
means for applying an operating potential to said power terminals of said regenerative circuit at a rate corresponding to that of said sampling signals for sensing the signals present at the outputs of said first and second circuits during a sampling signal and for producing at the comparator output terminal a signal indicative of which of the two signals has the greater magnitude.

4,001,614

BIAS CIRCUIT FOR A PHOTO-AVALANCHE DIODE

Rodney J. Dahlinger, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 27, 1975, Ser. No. 608,113
Int. Cl.² H03K *1/12*
U.S. Cl. 307—311 **5 Claims**



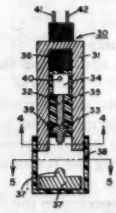
1. A photo-avalanche diode bias circuit comprising:
a. a photo-avalanche diode for receiving a light signal and generating an electrical output in response thereto;
b. capacitor means for providing a bias voltage for said diode, said diode being connected to a first plate of said capacitor means in shunt circuit relationship with said capacitor means;
c. energy supply circuit means for charging said capacitor means to a voltage level with respect to ground which is equal to the avalanche breakdown voltage of said diode in response to a first timing pulse; and
d. reference voltage circuit means connected to the second plate of said capacitor means for reducing said diode bias voltage provided by said capacitor by a predetermined amount to a level with respect to ground which is below that of said avalanche breakdown voltage of said diode in response to a second timing pulse.

4,001,615

ELECTRICALLY ACTUATED PIEZOELECTRIC HIGH VOLTAGE IMPACT MECHANISM

Don A. Berlincourt, Chagrin Falls, Ohio

Filed May 7, 1973, Ser. No. 357,647
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.3 **29 Claims**



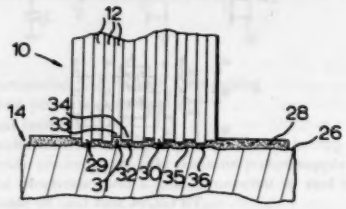
1. An electrically actuated impact type piezoelectric mechanism comprising:
piezoelectric element means effective to provide an electrical spark source in response to mechanical actuation thereof;
frame means of magnetic material;
coil means;
hammer means; disposed such that actuation of coil means from a low voltage electrical power source causes impact of the hammer against adjacent end means of piezoelectric element means as the magnetic circuit is essentially closed;
in combination with burner system means comprising:
at least one air-fuel mixture burning device;
at least one electrode tip means connected electrically to the high voltage output of the piezoelectric mechanism and located adjacent to at least one air-fuel mixture burning device;
electric switch control means to connect and disconnect electric power to coil means of the piezoelectric mechanism.

4,001,616

GROUNDING OF OUTER WINDING INSULATION TO CORES IN DYNAMOELECTRIC MACHINES

Palmer Lonseth; Neil Robertson Selkirk, and Hubert Gerald Panter, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Feb. 10, 1975, Ser. No. 548,835
Claims priority, application Canada, Feb. 18, 1974, 192819
Int. Cl.² H02K *15/12*
U.S. Cl. 310—45 **4 Claims**



1. A core and coil structure for a dynamoelectric machine comprising a stack of laminations formed with slots for receiving sides of coils; and a winding of coils having sides disposed in said slots and end turns projecting from the core stack, each one of said coil sides having at least one conductor strand encased in a hard, unyielding jacket of insulating materials and the jacket of insulating materials covered by a hard, unyielding, semiconducting armor jacket; variations in the laminations and the surface of said armor jacket defining voids between the armor jacket and the slot wall; the improved means for conducting electric charge from said armor jacket to said core stack comprising a pressure deformable, semiconducting material located continuously between said armor jacket and said slot wall, said semi-conducting material being deformed by pressure into said voids and having an electrical resistance low enough to conduct electric charge from said armor jacket to said core stack and high enough to avoid significant eddy current flow between core laminations; and, wherein said semi-conducting material is a room temperature vulcanizing silicone resin filled with fine particle graphite and/or lamp black in an amount that gives the filled resin an electrical resistance within an approximate range of 1000 to 80,000 ohms per square.

4,001,617

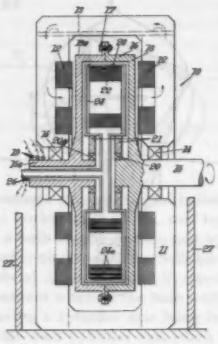
ROTARY ELECTRICAL MACHINES COMPRISING A SUPERCONDUCTIVE WINDING

Lionel Boyer, Alfortville, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed May 29, 1975, Ser. No. 581,756
Claims priority, application France, June 7, 1974, 74.19671
Int. Cl.² H02K *9/00*
U.S. Cl. 310—52 **9 Claims**

1. In a rotary electrical machine comprising: a superconduc-

tive field winding located in a cryostat, mounted for rotation around an axis, and producing a field rotating at the same speed as the field winding when direct current circulates therein; stator windings arranged to produce a field rotating at the same speed as the field winding when poly-phase currents flow therethrough and cooperating with the field winding; and electrically conductive rotary means carried by a mechanical power transmission shaft and disposed between the field winding and the stator windings through which flow, during operation, currents for producing a field which counteracts the torque exerted on the field winding, the improvement comprising a flat annular winding constituting the field winding and supplying a field the field lines of which are substantially parallel to the axis of rotation of the field winding in the space between the field winding and the stator windings, said stator windings axially straddling the field winding and being separated therefrom by said electrically conductive means.



4,001,618

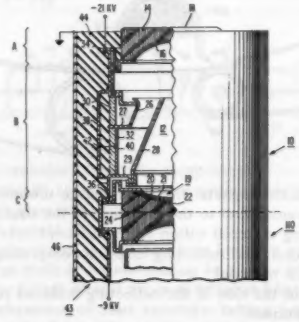
ELECTRON DISCHARGE IMAGE TUBE WITH ELECTROSTATIC FIELD SHAPING ELECTRODE

Paul Warren Kaseman, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 545,154, Jan. 29, 1975, abandoned. This application Nov. 10, 1975, Ser. No. 630,652

Int. Cl.² H01J *39/04, 31/50*

U.S. Cl. 313—94 **9 Claims**



1. An electron discharge tube including:

a. an input portion including an electron emissive cathode capable of emitting electrons as an electron-image in response to a radiation image impinging thereon,

b. an output means for receiving said electron-image and for providing a read-out of said electron-image; said output means including an electron-image receiving member in spaced-apart facing relation to said cathode;

c. hermetically sealed envelope means fixably supporting and electrically isolating said cathode and said output means at opposing ends of a tubular envelope portion whereby an electron accelerating cavity extends within the interior of said tubular envelope means between said cathode and said electron-image receiving member;

d. an electron lens system capable of accelerating electrons emitted from said cathode to impinge upon a surface portion of said electron-image receiving member as an electron-image; said electron lens system including at least two electrically isolated electron focussing electrodes secured within said cavity at opposing ends of the tube by said envelope means; said focussing electrodes being electrically isolated from each other by a tubular insulating member of said tubular envelope portion having an interior wall surface facing said cavity within said tube;

e. a tubular electrostatic field shaping electrode extending coaxially about the entire interior wall surface of said tubular insulating member facing said cavity; said field shaping electrode being capable of substantially preventing electron bombardment of said interior wall surface by divergent electrons and of substantially avoiding, during operation of the tube, spurious output signals resulting from the generation of positive ions from that surface as a consequence of such electron bombardment; and

f. a housing surrrounding said envelope means; said housing including a conductive shield which coaxially surrounds said envelope means and said field shaping electrode; said shield being capable of establishing a ground plane electrically isolated from electrical potentials which may be applied to said focussing electrodes, field forming electrode, said cathode, and said receiving member.

4,001,619

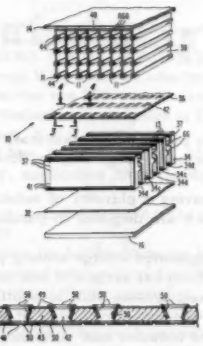
MODULATION MASK FOR AN IMAGE DISPLAY DEVICE

John Guiry Endriz, Plainsboro, and Carmen Anthony Catanese, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,502

Int. Cl.² H01J *43/00*

U.S. Cl. 313—105 R **24 Claims**



1. A substantially planar modulation mask for an area cathode cathodoluminescent image display device, which comprises:

a metal sheet having a plurality of substantially identical apertures which are disposed in parallel rows and columns,

a plurality of segmented charge sensing pads disposed on but insulated from one surface of said metal sheet with at least one of said sensing pads in abutting relation with each of said apertures, each one of said sensing pads being disposed between said columns of apertures and extending for less than the full number of said rows of apertures, said sensing pads including a portion which extends beyond said abutting apertures, said extended portion including a material having a high secondary emission ratio, and

a plurality of substantially parallel modulating electrodes disposed on but insulated from the other surface of said metal sheet with each one of said modulating electrodes extending around one of said parallel columns of apertures.

4,001,620

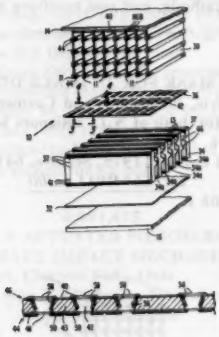
MODULATION MASK FOR AN IMAGE DISPLAY DEVICE

John Guiry Endriz, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,631

Int. Cl.² A01J *43/00*

U.S. Cl. 313—105 R **28 Claims**



1. A substantially planar modulation mask for an area cathode cathodoluminescent image display device, which comprises:

a metal sheet having a plurality of substantially identical apertures which are disposed in parallel rows and columns,

a plurality of segmented charge sensing pads disposed on but insulated from one surface of said metal sheet with at least one of said sensing pads in abutting relation with each of said apertures, each one of said sensing pads being disposed between said columns of apertures and extending for less than the full number of said rows of apertures, and

a plurality of substantially parallel modulating electrodes disposed on but insulated from the other surface of said metal sheet with each one of said modulating electrodes extending around one of said parallel columns of apertures.

4,001,621

INCANDESCENT LAMP HAVING A REFLECTING DOME AND SPHEROCONICAL ENVELOPE

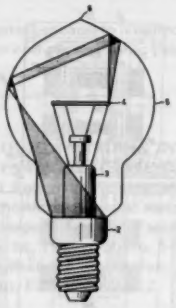
Henri Pacé, Bures-sur-Yvette; Marcel Lavedrine, Garches, and Jean Berdou, Bois-Colombes, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1975, Ser. No. 596,661

Claims priority, application Spain, Dec. 24, 1974, 433316

Int. Cl.² H01K *1/32*

U.S. Cl. 313—113 **4 Claims**



1. An incandescent lamp which comprises: a filament, a cap and an envelope cooperating with said cap and having a reflecting dome, said envelope including means to divert substantially all the rays issuing from the filament which fall on said dome to experience at least two reflections before reaching said cap.

4,001,622

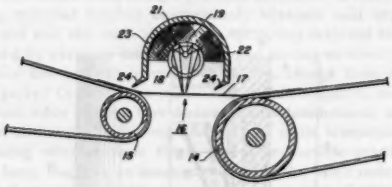
DIRECTIONAL SOURCES OF ELECTROMAGNETIC RADIATION

Michael L. Howell, Park End, near Lydney, England, assignor to Rank Xerox Ltd., London, England

Filed Oct. 3, 1974, Ser. No. 511,823

Int. Cl.² H01J *5/16*; H05B *1/00*

U.S. Cl. 313—113 **2 Claims**



1. An electromagnetic radiation source mounted within a container transparent to the radiation of the source;

a reflecting material within which the container is partially embedded, said reflecting material comprising a ceramic fiber felt material;

a shield on the side of the reflecting material remote from the container;

said shield defining a mouth opening in one direction, through which the radiation can pass, both edges of the shield being inclined in a second direction inclined to said first direction so as to guide material passing across said mouth out of said mouth.

4,001,623

ARC TUBE FOR HIGH-PRESSURE MERCURY/METAL HALIDE LAMP

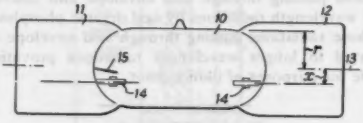
Donald Arthur Howles, and Robert Brian Page, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Mar. 18, 1975, Ser. No. 559,536

Claims priority, application United Kingdom, Mar. 20, 1974, 12410/74

Int. Cl.² H01J 61/068, 61/20, 61/30

U.S. Cl. 313—184 5 Claims



1. In a high-pressure mercury/metal halide discharge lamp for operation in a horizontal position, said lamp having an arc tube comprising a bulb closed at each end by a press seal and containing discharge electrodes, the bulb having a wall which is symmetrical about a plane generally parallel to the press seals, the improvement wherein the bulb wall has a part-cylindrical portion having a cylinder axis lying in said plane, said portion being below said cylinder axis when the lamp is in its horizontal operating position, and said discharge electrodes are positioned in alignment with one another in said plane and offset in the same direction below said cylinder axis to lie between the cylinder axis and said part-cylindrical wall portion.

4,001,624

SOFT GLASS FLASHTUBE

Robert J. Cosco, Amesbury; Roger T. Hebert, Peabody, and Paul E. Gates, Danvers, all of Mass., assignors to GTE Sylvania Incorporated, Salem, Mass.

Filed June 6, 1975, Ser. No. 584,425

Int. Cl.² H01J 65/00

U.S. Cl. 313—185 16 Claims

1. A wall-stabilized flashtube comprising:

an hermetically sealed, light-transmitting envelope formed of a soft glass tubing;

a rare gas in said envelope; and

a pair of electrodes in said envelope between which an arc discharge path is defined during operation of said flashtube, the length of said arc path being at least double the inside diameter of said envelope tubing whereby said discharge is wall-stabilized, the maximum loading of said flashtube being about 10 joules per square centimeter of the interior surface area of said tubular envelope for flash durations of about 250 microseconds or less as measured between the one-third-of-peak points of the light output pulse.

4,001,625

HIGH-PRESSURE DISCHARGE LAMP HAVING A METAL LEAD THROUGH CONDUCTOR

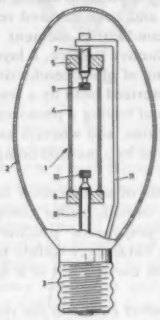
Bralt Renze Schat, and Abraham Timmermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 332,120, Feb. 13, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,740

Claims priority, application Netherlands, Feb. 21, 1972, 7202270

Int. Cl.² H01J 61/30, 61/36

U.S. Cl. 313—220 4 Claims



1. A discharge lamp which comprises: an elongated generally tubular discharge tube formed of a material which is primarily aluminum oxide; a pair of disc-shaped closure members disposed at each end of said tube, each of said closure members having a passage-way therethrough and being formed of an aluminum oxide cermet; a pair of generally tubular lead-through conductors disposed in axially aligned relationship, each extending through said closure members, said cermet having a coefficient of thermal expansion intermediate the coefficient of thermal expansion of said conductors and said discharge tube, said discharge tube conductors being disposed in sealing engagement directly with said closure member.

4,001,626

HIGH PRESSURE TIN HALIDE DISCHARGE LAMP

Peter Cornelis Drop; Willy Joseph Catharina Endevoets; Antonie Peter Lambertus van Eijl, and Alexander Gray Jack, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,057

Claims priority, application Netherlands, Nov. 26, 1973, 7316101

Int. Cl.² H01J 61/18

U.S. Cl. 313—229 7 Claims

1. A high pressure tin halide discharge lamp having a discharge vessel provided with electrodes between which the discharge is maintained during operation, and comprising a filling of a quantity of rare gas as a starter gas and furthermore percubic cm of contents of the discharge vessel between 0 and 50 mg of mercury and at least 1 μmol of at least one of the halides of tin, characterized in that the discharge vessel comprises at least one of the substances selected from the group consisting of elemental indium, bismuth, lead, gallium and zinc and the halides of said elemental substances to correct the color point of the radiation emitted by the lamp and means for generating a magnetic field during operation which counteracts the upward curvature of the discharge arc.

4,001,627

METHOD OF PREPARING CONDUCTRON-TYPE PHOTOCONDUCTORS AND THEIR USE AS TARGET MATERIALS FOR CAMERA TUBES

Shmuel Mardix, Kingston, R.I.; Paul M. McIlvaine, West Willington, Conn., and Sol Nudelman, Tucson, Ariz., assignors to Board of Regents for Education of the State of Rhode Island, Providence, R.I.

Division of Ser. No. 437,775, Jan. 30, 1974, Pat. No. 3,950,272. This application Nov. 5, 1975, Ser. No. 629,012

Int. Cl.[2] H01J *31/00*

U.S. Cl. 313—385 11 Claims

1. In a camera tube which employs a photo-responsive target, the improvement which comprises employing as said target a photoconductive element characterized by a photoresponse in the visible and near infrared region to about 1.6μ wherein said photoconductive element comprises a solid, transparent and conductive surface, a layer of epoxy resin as a binder, and a coating of photoconductive silver sulfide said element being characterized both by a resistivity on the order of 1×10^6 ohm-cm. and having a photoresponse in the visible and near infrared regions, and wherein said photoconductive silver sulfide is prepared by a method comprising the following steps:

a. reacting an excess of silver cation in an aqueous acidic solution with an organic sulfur compound to provide a microcrystallite suspension predominantly comprising photoconductive beta-silver sulfide in the reaction solution, said reaction carried out at a temperature of from about 0°–15° C.;

b. reacting excess silver cation in the reaction solution with an inorganic source of sulfide ion to provide for the overgrowth of silver sulfide on the microcrystallites; and,

c. recovering the photoconductive silver sulfide produced thereby.

4,001,628

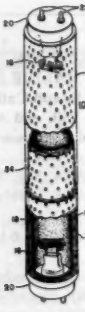
LOW-PRESSURE FLUORESCENT DISCHARGE DEVICE WHICH UTILIZES BOTH INORGANIC AND ORGANIC PHOSPHORS

Frederick M. Ryan, Loyalhanna Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,075

Int. Cl.[2] H01J *61/35, 61/48*

U.S. Cl. 313—487 14 Claims



1. A low-pressure, positive-column fluorescent lamp comprising an elongated visible-radiation-transmitting glass envelope which encloses a discharge-sustaining filling comprising mercury and inert starting gas, electrodes operatively positioned within said envelope proximate the ends thereof and adapted to sustain therebetween an operating discharge which generates ultraviolet radiations to which said envelope is substantially opaque, inorganic phosphor means carried on the interior surface of said envelope and operable to convert ultraviolet radiations generated by said operating discharge into visible radiations of predetermined wavelength, organic phosphor means carried on the outer surface of said envelope, said organic phosphor means operable to convert at least some of the wavelengths of the radiations passing through said envelope into longer wavelength visible radiations, said organic phosphor means occupying only a predetermined proportion of the outer surface of said envelope to intercept only a predetermined proportion of the total radiations passing through said envelope, said organic phosphor means having a predetermined thickness to provide a predetermined operational life for effective radiation conversion, and the blend of radiations passing through said envelope and converted to longer wavelength radiations by said organic phosphor means plus those radiations passing through said envelope and not converted to longer wavelength radiations providing light suitable for purposes of illumination.

4,001,629

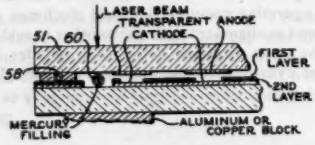
SEGMENTED GAS DISCHARGE DISPLAY PANEL

Stephen C. Thayer, Lewistown, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

Filed Aug. 26, 1974, Ser. No. 500,225

Int. Cl.[2] H01J *61/067, 61/30, 61/36, 61/66*

U.S. Cl. 313—517 3 Claims



1. In a gas discharge display panel having a pair of rigid, spaced apart members defining parallel flat boundaries between which information to be displayed is generated by plural discrete discharges between selected energized electrodes and a gas in said panel, the improvement in spacer sealant means for sealing the gas between said boundaries, framing the information display area and spacedly joining said rigid members wherein said spacer sealant is constituted by a first portion comprised of a fused screened on frit incorporating therein a plurality of discrete dimensionally uniform nonconductive spacer beads fusible at a higher temperature than said frit, said first portion having a pair of ends spaced apart to define a tubulationless vacuumization and gas fill port between said boundaries, and a second portion comprised of a gob of spacer free dielectric material bridging the said spaced apart ends of said first portion and completing said seal.

4,001,630

SELECTIVELY DAMPED TRAVELLING WAVE TUBE

Franz Gross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 465,260, April 29, 1974, abandoned. This application July 17, 1975, Ser. No. 596,643

Claims priority, application Germany, May 21, 1973, 2325716

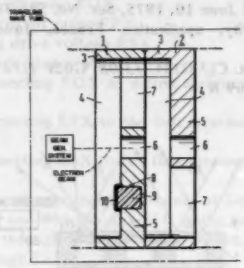
Int. Cl.[2] H01J *25/34*

U.S. Cl. 315—3.5 6 Claims

1. In a delay line for a travelling wave tube of the type having a periodicallly alternating magnetic field for guiding an electron beam produced by a beam generating system, said delay line comprising a plurality of partitions dividing said delay line into a plurality of cells positioned one behind the other in the direction of the electron beam, and at least one chamber resonator including damping material and coupled to at least one of the cells and having a resonant frequency that is approximately equal to a predetermined interference fre-

quency, the partitions having axially aligned openings for passage of the electron beam and coupling openings positioned at 180° from one partition to the next, the improvement therein comprising:

a recess in at least one of the partitions defining the chamber resonator located opposite the coupling opening for



that partition and having a resonant frequency whose most energetic oscillations corresponds at least approximately to the frequency of an interference mode which is above the operational frequency band, said recess comprising a blind bore extending partially through the partition axially parallel to the longitudinal axis of the delay line.

4,001,631

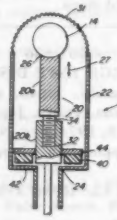
ADJUSTABLE LENGTH CENTER CONDUCTOR FOR TERMINATION FIXTURES FOR ELECTRODELESS LAMPS

William McNeill, Carlisle; Joseph Lech, Westford; Paul Haugsjaa, Acton, and Robert Regan, Newton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 570,109, May 21, 1975, Pat. No. 3,943,403. This application Nov. 17, 1975, Ser. No. 632,328

Int. Cl.² H01J *7/46, 19/80*

U.S. Cl. 315—39 **11 Claims**



1. A light source including:

a. a source of power at a high frequency,

b. an electrodeless lamp having an envelope made of a light transmitting substance, the envelope enclosing a volatile fill material which emits light upon breakdown and excitation, the lamp having a complex impedance in the operating condition,

c. a termination fixture coupled to the source, the fixture having an inner conductor and outer conductor disposed around the inner conductor, the conductors, having a first end which is coupled to the source and the inner conductor having a second end which couples power to the lamp, and

d. means for changing the effective length of the inner conductor so that the termination fixture matches the complex impedance of the lamp during the operating condition to an output impedance of the power source.

4,001,632

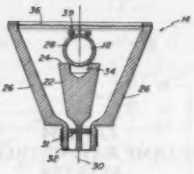
HIGH FREQUENCY EXCITED ELECTRODELESS LIGHT SOURCE

Paul Osborne Haugsjaa, Acton, and Robert James Regan, Needham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 21, 1975, Ser. No. 570,113

Int. Cl.² H05B *41/24*

U.S. Cl. 315—39 **21 Claims**



1. A light source including:

a. a source of power at a high frequency,

b. an electrodeless lamp having an envelope made of a light transmitting material and a volatile fill material disposed within the envelope, the fill material emitting light upon vaporization, partial ionization and excitation, and

c. a termination fixture coupled to the source, the fixture including an inner conductor and an outer conductor disposed around and insulated from the inner conductor, the conductors having dimensions such that the lamp may be located in the high field region at the ends of the inner and outer conductors to form a lossy open circuit termination for the high frequency power which when applied initiates breakdown, vaporization and excitation of the fill material within the lamp.

4,001,633

DEVICE PROVIDED WITH A GAS AND/OR VAPOR DISCHARGE TUBE

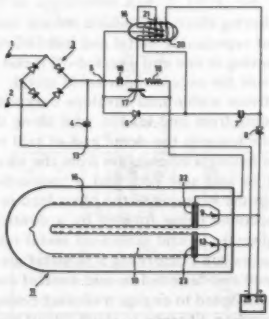
Hendricus Franciscus Joannes Jacobus van Tongeren; Jan Evert van der Werf, and Jean Johan Heuvelmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,280

Claims priority, application Netherlands, May 2, 1974, 7405871

Int. Cl.² H01J *17/34*

U.S. Cl. 315—47 **9 Claims**



1. Discharge tube apparatus which comprises: first and second input terminals, a discharge tube having first and second electrodes, an electric heating element which extends along at least part of the length of the tube and means for

controlling said electric heating element to maintain said tube at a temperature such that said tube is substantially maintained in the positive parts of the voltage-current characteristics of said tube, said means for controlling being provided with a control member which in the operating condition of the discharge tube mainly responds to variations of the effective value of the current flowing through the tube to control the current flowing through the heating element.

4,001,634

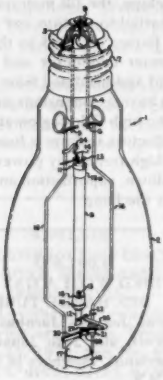
DISCHARGE LAMP HAVING THERMAL SWITCH STARTER

Eugene K. Corbley, Cleveland Hts., Ohio, and Richard L. Collister, Jr., Missoula, Mont., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,217

Int. Cl.² H01J *61/56*

U.S. Cl. 315—73 **12 Claims**



1. A vapor discharge lamp of the type adapted to be operated from an inductive ballast comprising:

an outer vitreous envelope domed at the distal end and having a base attached to the near end, and a pair of lead-in wires sealed into said envelope and connected to said base;

an arc tube having electrodes sealed therein and containing a charge of vaporizable metal and inert starting gas, said arc tube having at one end a sealed-off metal tube serving as a reservoir for excess vaporizable metal;

a mounting frame within said envelope comprising one side rod extending from one lead-in wire along the length of the arc tube towards the dome end of said envelope;

said arc tube having a connection from the electrode at the distal end to said side rod, and a connection from the electrode at the near end to the other lead-in wire, one of said connections being formed by a control conductor attached directly to said sealed-off metal tube reservoir;

and a thermal switch comprising a bi-metal member having its restrained end fastened to said control conductor and its free end adapted to engage a contact connected to said other connection whereby to short circuit said arc tube at starting, said bi-metal having a thermal mass in relation to its electrical resistance low enough that it is quickly deflected by self heating caused by short circuit current therethrough in order to open said contacts and start said arc tube.

4,001,635

ELECTRO-OPTICAL CONVERTER AND AN OPTICAL INFORMATION RECORDING SYSTEM COMPRISING SUCH A CONVERTER

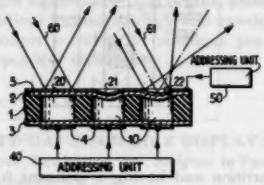
Luigi d'Auria; Jean-Pierre Huignard; Jean Philippe Reboul, and Francois Le Carvennec, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 10, 1975, Ser. No. 585,581

Claims priority, application France, June 14, 1974, 74.20713

Int. Cl.² G11C *13/08*; G02F *1/31*

U.S. Cl. 315—169 R **6 Claims**



1. An electro-optical converter comprising: a substrate, with two parallel faces, wherein holes are made providing apertures on said two faces; two dielectric layers respectively arranged on said two faces, at least one of said layers being a flexible reflective diaphragm, a gas being arranged in the cells limited by said holes and said dielectric layers; two sets of electrodes respectively arranged on said two dielectric layers above said apertures, each set being formed by parallel electrodes in a direction making an angle other than zero with the electrodes of the other set; supply means for selectively supplying said electrodes in order to ionize the gas contained in the cells located between two electrodes supplied and to produce electrical charges which, in a first step, when deposited on said dielectric layers, produce electrostatic forces which deforms locally said flexible diaphragm and which, in a second step, neutralize electrical charges created in said first step, said supply means being adapted for receiving recording and erasing electrical control signals for respectively controlling said first and second steps.

4,001,636

AC DRIVE DISCHARGE TYPE DISPLAY APPARATUS

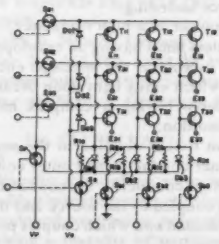
Hiroshi Tottori, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,787

Claims priority, application Japan, Oct. 16, 1973, 48-116192

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **2 Claims**



2. An AC drive type display apparatus which comprises: a discharge type panel having a plurality of electrodes, a drive circuit for the electrodes comprising:

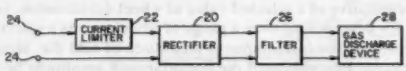
a plurality of transistors T11, T12, T13, T21, T22, T23, T31, T32 and T33,
a plurality of diodes D*a*1, D*a*2, D*a*3 and D*b*,
a resistor R_s,
a plurality of switches S*a*1, S*a*2, S*a*3, S*b*1, S*b*2, S*b*3, SQX, SPX and SSX,
a first turn off pulse EQX,
a second turn off pulse EPX,
a sustaining drive voltage ESX,
a bias voltage source VB,
means connecting EQX to a first terminal of D*b* through SQX,
means connecting EPX to the first terminal of D*b* through SPX,
means connecting ESX to the first terminal of D*b* through SSX,
means connecting a second terminal of D*b* of the bases of T11, T21 and T31 through S*b*1, to the bases of T12, T22 and T32 through S*b*2 and to the bases of T13, T23 and T33 through S*b*3,
means connecting the first terminal of D*b* to the emitters of T11, T12 and T13 through D*a*1, to the emitters of T21, T22 and T23 through D*a*2 and to the emitters of T31, T32 and T33 through D*a*3,
means connecting the first terminal of D*b* to a first terminal of VB,
means connecting a second terminal of VB to the emitters of T11, T12 and T13 through R2 and S*a*1, to the emitters of T21, T22 and T33 through R2 and S*a*2 and to the emitters of T31, T32 and T33 through R2 and S*a*3,
means connecting an output terminal E11 to the collector of T11,
means connecting an output terminal E12 to the collector of T12,
means connecting an output terminal E13 to the collector of T13,
means connecting an output terminal E21 to the collector T21,
means connecting an output terminal E22 to the collector of T22,
means connecting an ouput terminal E23 to the collector of T23,
means connecting an output terminal E31 to the collector of T31,
means connecting an output terminal E32 to the collector of T32, and
means connecting an output terminal E33 to the collector of T33.

4,001,637

LAMP BALLAST

George W. Gray, West Palm Beach, Fla., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed June 12, 1975, Ser. No. 586,251
Int. Cl.² H05B *41/16*
U.S. Cl. 315—205 14 Claims



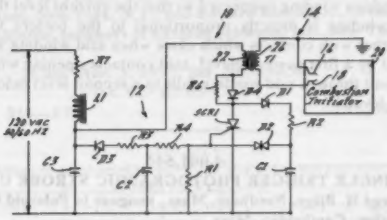
1. For use in a circuit for coupling an electrical vapor lamp to a cyclic electrical power source, a ballast comprising in series:
first substantially non-inductive, non-dissipative, capacitive, current limiting means having an input couplable to said source;
rectifying means connected to the output of said current limiting means; and
filter means having an input connected to the output of said rectifying means, and an output connectable to said lamp.

4,001,638

IGNITION SYSTEM

Frederick T. Bauer, and Frederick J. Geary, both of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 29, 1974, Ser. No. 528,158
Int. Cl.² H05B *37/02*; F23Q *3/00*
U.S. Cl. 315—209 SC 7 Claims



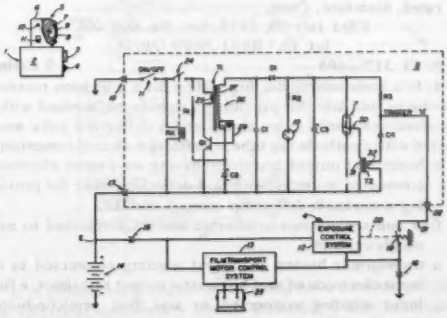
1. In an ignition system, the combination comprising plasma generating means adapted to be connected to a main line source of AC current, and combustion initiation means operatively connected to said plasma generating means, said plasma generating means including a silicon controlled rectifier having an anode, a cathode and a gate, a transformer having a primary winding and a secondary winding, a first capacitor, a first diode and a first resistor, said primary winding and said first diode being connected in series with said anode and said cathode, said first resistor being connected in parallel with said first diode, said first capacitor being connected in parallel with said anode and said cathode through said primary winding, said plasma generating means also incuding trigger means, said trigger means including said silicon controlled rectifier, second and third resistors, a second diode, a second capacitor and a trigger diode, said second resistor, said second diode, said second capacitor and said trigger diode being connected across said anode and said cathode of said silicon controlled rectifier, said third resistor being connected to said gate.

4,001,639

PREFERENTIAL POWER DISTRIBUTION SYSTEM FOR BATTERY POWERED CAMERA HAVING ELECTRONIC FLASH UNIT

Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 404,033, Oct. 5, 1973, abandoned, which is a division of Ser. No. 320,602, Jan. 2, 1973, Pat. No. 3,810,212. This application Apr. 7, 1975, Ser. No. 565,426
Int. Cl.² H05B *37/00*
U.S. Cl. 315—241 P 7 Claims



1. An electronic flash unit, of the type connectable to a

battery, comprising a gas discharge tube, a capacitor connected to said tube, a voltage converter connected to said capacitor and responsive to applied current to charge said capacitor, and a relay responsive to the voltage of the battery for supplying current from the battery to said voltage converter when the voltage of the battery goes above a first value and continuing to supply current from the battery to said voltage converter until the voltage of the battery goes below a second value lower than said first value in which said relay includes a winding connected so that the current level through the winding is directly proportional to the battery voltage together with contacts which close when said winding is energized by a first current elevel, said contacts opening when the current through said winding falls to a second level below said first level.

4,001,640

SINGLE TRIGGER PHOTOGRAPHIC STROBE UNIT

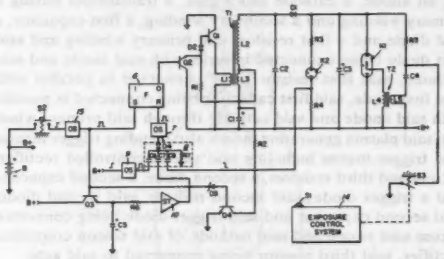
Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 320,447, Jan. 2, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,503

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² H05B *41/29*

U.S. Cl. 315—241 P **15 Claims**



14. An electronic flash operating system comprising a storage capacitor, charge control means settable to a first state and a second state for supplying charging current to said capacitor in said first state, manually operable means for setting said charge control means to said first state, and means responsive to the discharge of said capacitor for setting said charge control means to said second state.

4,001,641

HORIZONTAL DEFLECTION SYSTEM

Martin Fischman, Seneca Falls, and Jesse H. L'Hommedieu, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 30, 1975, Ser. No. 600,405

Int. Cl.² H01J *29/70, 29/76*

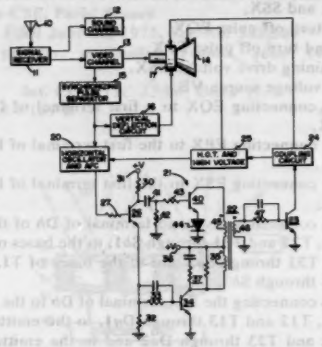
U.S. Cl. 315—408 **9 Claims**

1. In a horizontal deflection system for a television receiver having an oscillator for providing a signal synchronized with a received composite video signal and a deflection yoke associated with a cathode ray tube, a deflection circuit comprising:

a horizontal output transistor having an output electrode connected in circuit with said deflection yoke for providing a sawtooth deflection current thereto;

first and second semiconductor drivers connected to said oscillator; and

a transformer having an output winding connected to an input electrode of said horizontal output transistor, a first input winding connected to said first semiconductor driver and having a low coupling coefficient with said output winding for providing a sawtooth drive current from said output winding to said input electrode sufficient to cause said horizontal output transistor to conduct in saturation in response to energization of said first input winding by said first semiconductor device, and a second input winding connected to said second semiconductor



driver and having a high coupling coefficient with said output winding for causing a reverse current to flow from said input electrode to rapidly switch said horizontal output transistor to a non-conducting state.

4,001,642

ANTI-LOCK VEHICLE BRAKE SYSTEMS

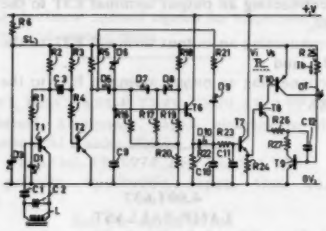
Derek Robert Skoyles, and Denis Sharp, both of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 368,953, June 11, 1973, abandoned. This application May 5, 1975, Ser. No. 574,615

Claims priority, application United Kingdom, June 19, 1972, 28587/72

Int. Cl.² B60T *8/10, 8/02*

U.S. Cl. 317—5 **1 Claim**



1. A wheel slip detector for an anti-lock vehicle brake system, said detector comprising means for producing a d.c. signal the amplitude of which is a function of wheel speed, means for establishing a reference rate of change signal which is representative of a selected value of wheel deceleration, and means for determining over a range of wheel speeds a selected percentage of the instantaneous amplitude of said d.c. signal, said selected percentage of the instantaneous amplitude being proportional to the actual wheel speed and means to produce an output for anti-lock braking control in response to change in the instantaneous amplitude of said d.c. signal greater than said selected percentage and at a rate of change in excess of said reference rate of change parameter, said means for establishing a reference rate of change signal comprises a Miller capacitor which is connected to be discharged by the action of a transistor, and said means for determining a selected percentage of the instantaneous amplitude of said d.c. signal comprises a resistance divider chain which is connected effectively at one end to receive said d.c. signal and at the other end

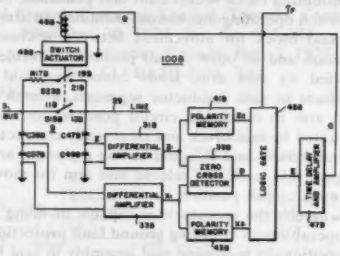
to the collector of said transistor, said capacitor being connected between the base of said transistor and a point on said divider chain at which said selected percentage of the d.c. signal is present.

4,001,643

METHOD AND APPARATUS FOR A POWER CIRCUIT BREAKER CONTROLLER

Harold C. Ramberg, Canby, and Alvin C. Legate, Beaverton, both of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 29, 1975, Ser. No. 582,005
Int. Cl.² H01H 7/16
U.S. Cl. 317—11 E 7 Claims



1. A programable method for limiting the voltages surges on a high voltage alternating current power line upon closure of a main contact switch which is connected in parallel with a single normally preinsertable resistor comprising the steps of:

first continuously monitoring the polarity of the bus voltage and trapped line charge voltage on both sides of said main switch at the time said switch is opened;

second comparing the monitored polarities against each other and when of equal polarity, operatively inserting said resistor into the power line before closure of said main switch; and then

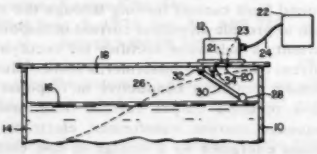
predetermining the time of closure of said main switch when the voltage difference between its bus and line sides will be near zero and then effectively by-passing the inserted preinserted single resistor by closure of the main contact switch.

4,001,644

SUDDEN PRESSURE RELAY HAVING SEISMIC PROTECTION

Robert C. Lingenfelter; Curtis L. Moore, and James J. Kunes, all of Sharon, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1975, Ser. No. 562,617
Int. Cl.² H02H 7/04
U.S. Cl. 317—14 G 8 Claims



1. Stationary electrical apparatus having a tank containing a fluid dielectric with a gas space located above the level of the fluid dielectric,

a sudden pressure relay system including detecting means for detecting a sudden increase in gas pressure within the tank and activating a circuit in response thereto, said detecting means including means for making the detecting means insensitive to relatively slow increases in gas pressure within the tank and

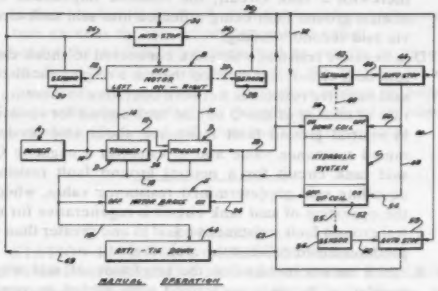
defeating means for preventing activation of said circuit by the detecting means when the sudden increase in gas pressure is caused by an abrupt change in the dielectric level due to a seismic disturbance.

4,001,645

DIE PRESS CONTROL APPARATUS

Edgar Haas, New York, N.Y., and Edward Kottsieper, Dresden Mills, Maine, assignors to Herman Schwabe, Inc., New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,906
Int. Cl.² H01H 47/00
U.S. Cl. 318—17 15 Claims



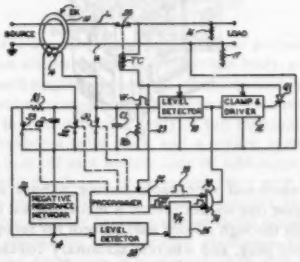
1. Apparatus for controlling the movement of a member in a first sense and a second sense comprising first means for moving the member in first and second directions in the first sense and second means for moving the member in first and second directions in the second sense and first and second switch means operatively connected to said first and second moving means and actuatable separately to energize said first means to move the member in said first direction in said first sense and said second direction in said first sense, respectively, and actuatable jointly to energize said second means to move the member in said first direction in said second sense.

4,001,646

GROUND FAULT CIRCUIT INTERRUPTER UTILIZING A SINGLE TRANSFORMER

Edward Keith Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 16, 1975, Ser. No. 586,864
Int. Cl.² H02H 3/26
U.S. Cl. 317—18 D 19 Claims



1. A ground fault circuit interrupting device for monitoring an electrical distribution circuit including a line conductor and a neutral conductor grounded at the source and interrupting the circuit in the event of a ground fault on the line con-

ductor resulting in a ground fault current exceeding a predetermined current value and a ground fault on the neutral conductor of a resistance below a predetermined resistance value, said device comprising, in combination:

A. a differential current transformer having

1. a first winding for connection in series with the line conductor,
2. a second winding for connection in series with the neutral conductor,
3. a third winding in which is developed a fault signal proportional in amplitude to the ground fault current occasioned by a ground fault on the line conductor;

B. first means monitoring the amplitude of said fault signal and initiating circuit interruption when said fault signal amplitude exceeds a first predetermined threshold level correlated to said predetermined current value;

C. second means connected with said third winding to form therewith a tank circuit, the resistive impedance of a neutral ground fault being reflected into said tank circuit via said second winding;

D. a negative resistance network connected to shock excite said tank circuit and develop therein a ringing oscillation, said negative resistance network operative to increase the rate of change of the Q of said tank circuit for variations in neutral ground fault resistance about said predetermined resistance value and to establish a negative Q in said tank circuit for a neutral ground fault resistance equalling said predetermined resistance value, whereby the operation of said tank circuit is regenerative for neutral ground fault resistances equal to and greater than said predetermined resistance value; and

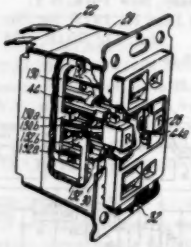
E. third means monitoring the amplitude of said ringing oscillation during a prescribed time period succeeding shock excitation of said tank circuit to detect a neutral ground fault having resistance below said predetermined resistance level, whereupon to initiate circuit interruption.

4,001,647

GROUND FAULT RECEPTACLE WITH UNITARY SUPPORT OF GFCI MODULE AND SWITCHING MECHANISM

Keith W. Klein, Simsbury, and Joseph M. Palmieri, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,850
Int. Cl.² H01H 73/06
U.S. Cl. 317—18 D **10 Claims**



1. In an electrical receptacle having a base and cover, wherein at least one socket means is incorporated in the base and accessible through a front wall thereof for reception of an appliance cord plug, and wherein stationary contacts electrically connected to the socket means are mounted in the base, a ground fault circuit interrupter assembly comprising, in combination:

A. a support plate having means for cooperating with the base in positionally mounting said plate in the base proximate its junction with the cover, said plate having a front surface for disposition in spaced, parallel relation to the front wall of the base and a rear surface;

B. a ground fault circuit interrupter module including a differential current transformer having a wound toroidal core and a pair of conductor segments extending through the central aperture of said core, a circuit board, electronic components mounted on said board in electrical interconnection, and leads connected between said transformer and said circuit board;

C. first means integrally formed with said plate in outstanding relation with its rear surface providing a cavity accommodating said transformer;

D. second means integrally formed with said plate in outstanding relation with its rear surface supporting said board in spaced, parallel relation with said rear surface;

E. a pair of spaced pedestals integrally formed with said plate in outstanding relation with its front surface;

F. a mounting block secured on said pedestals; and

G. a switch operating mechanism including an arm mounted by said block for movement between a closed circuit position and an open circuit position, movable contacts carried by said arm, leads connecting said movable contacts to said conductor segments, a latch detaining said arm in its closed circuit position, and a solenoid mounted by said block and electrically connected to said circuit board, said solenoid having a plunger arranged to engage said latch and release said arm for movement to its open circuit position;

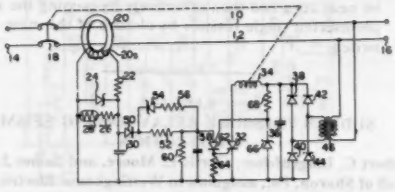
I. whereby the receptacle is capable of being tested for operability in affording ground fault protection prior to positionally mounting said assembly in said base.

4,001,648

GROUND FAULT DETECTOR

Katsumi Taketa; Hirotoshi Nitta, and Eiichi Sato, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 468,150, May 8, 1974, abandoned.
This application Nov. 5, 1975, Ser. No. 629,626
Claims priority, application Japan, May 19, 1973, 48-56181
Int. Cl.² H02H 3/30
U.S. Cl. 317—18 D **2 Claims**



1. A ground fault detector device comprising:

a zero phase-sequence current transformer, electrically connected to an electric circuit path which includes an electrically energized circuit interrupter, to detect a ground fault current flowing through the electric circuit path to provide an output current in response to the fault current; a half-wave rectifier for rectifying the output current from said transformer; a semiconductor switching element rendered conductive in response to said half-wave rectified output current from said zero phase-sequence current transformer; electromagnetic circuit means energized by a voltage in said electric path and responsive to the conduction of said semiconductor switching element to energize said circuit interrupter connected in said electric path to open said electric path; and circuit means including a resistor having a relatively high magnitude of resistance, a capacitor connected in cascade with said resistor and a constant voltage element having a voltage dependent impedance connected across

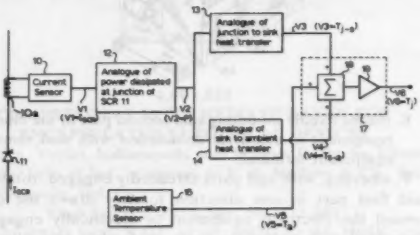
said resistor, said circuit means applying through said resistor the half-wave rectified output current from said current transformer less than a predetermined magnitude to gradually increase a potential across said capacitor to a predetermined magnitude whereupon said semiconductor switching element is put in its conducting state to energize said circuit interrupter, said constant voltage element responding to the half-wave rectified output current from said current transformer in excess of the first-mentioned predetermined magnitude to instantaneously increase the current flowing to said capacitor to put said semiconductor switching element in its conducting state.

4,001,649

TEMPERATURE MONITORING OF SEMICONDUCTORS

John A. I. Young, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Dec. 30, 1975, Ser. No. 645,323
Claims priority, application Canada, Dec. 3, 1975, 241111
Int. Cl.² H02H *5/04, 7/14*
U.S. Cl. 317—41 **14 Claims**


Analogue of junction to sink heat transfer
Current Sensor
Analogue of power dissipated at junction of SCR 11
Analogue of sink to ambient heat transfer
Ambient Temperature Sensor

1. A circuit for monitoring the temperature of a junction of a semiconductor device comprising:

a. means to produce a first signal proportional to the power dissipated at the junction of the semiconductor device;

b. first means responsive to said first signal to produce a second signal proportional to the difference between the junction temperature and the temperature of a heat sink associated with said device;

c. second means responsive to said first signal to produce a third signal proportional to the difference between the heat sink temperature and ambient temperature;

d. means to produce a fourth signal proportional to the ambient temperature; and,

e. combining means to combine said second, third and fourth signals to provide an output signal proportional to said junction temperature.

4,001,650

METHOD AND APPARATUS FOR ULTRASONIC TRANSDUCER PROTECTION

Jack Romain, Santa Monica, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

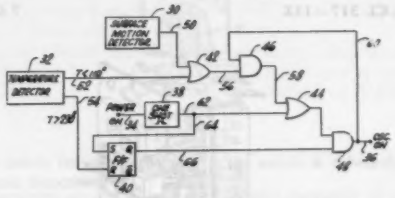
Filed Sept. 2, 1975, Ser. No. 609,310
Int. Cl.² H02H *5/04*
U.S. Cl. 317—41 **19 Claims**

5. Apparatus for the automatic protection of an ultrasonic transducer which is operated immersed in a liquid, said apparatus comprising:

surface motion detection means coupled to the transducer and operable to generate an electrical signal when the surface motion of the liquid exceeds a predetermined threshold level;

transducer temperature detection means, including means for generating a first temperature signal if the transducer temperature exceeds a first predetermined value, and means for generating a second temperature signal if the transducer temperature exceeds a second predetermined value greater than the first predetermined value; and

electrical means coupled with said surface motion detection means and said temperature detection means, for switching the transducer to an off condition if the transducer temperature exceeds the first predetermined value and no



surface motion is detected, or if the transducer temperature exceeds the second predetermined value;

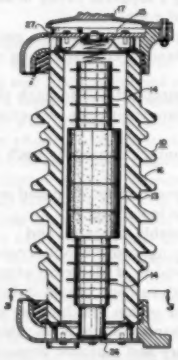
whereby the transducer is permitted to remain in an on condition if its temperature is below the first predetermined value, even if there is no surface motion, in order to permit adjustment of the transducer without its being automatically turned off when surface motion stops.

4,001,651

STATION LIGHTNING ARRESTER WITH DUAL RUPTURE DIAPHRAGMS FOR GAS PRESSURE RELEASE

Stanley Scott Kershaw, Jr., Greendale, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 5, 1975, Ser. No. 574,410
Int. Cl.² H02H *3/22*
U.S. Cl. 317—61 **10 Claims**



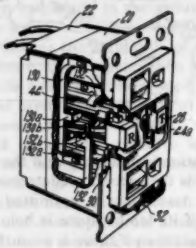
1. A surge arrester comprising a hollow porcelain body, top and bottom pieces sealing said porcelain body, gap assemblies in series with negative resistance elements, said gap assemblies and negative temperature coefficient resistance elements centered in said porcelain body, a top terminal of the surge arrester having a solid plate and a dished metal diaphragm sealed to seal off said hollow core of said surge arrester, the dished metal diaphragm in communication with a passageway cast in the top end piece of said surge arrester, the bottom end of said surge arrester having a dished metal diaphragm sealing said gap assemblies and negative resistance elements, said dished metal diaphragm in communication with a passageway whereby the gases may be freely vented on rupture of the dished metal diaphragm, a bottom end piece affixed to the bottom sealing portion of said surge arrester arranged to blow off on a buildup of excessive pressure within the surge arrester.

4,001,652

GROUND FAULT RECEPTACLE WITH IMPROVED STATIONARY CONTACT MOUNTING AND BACKING

Keith W. Klein, Simsbury, and Joseph M. Palmieri, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,998
Int. Cl.² H01H 73/06
U.S. Cl. 317—112 **7 Claims**



1. An electrical receptacle equipped to provide ground fault protection, said receptacle comprising, in combination:

A. insulative, generally rectangular housing consisting of
   1. a base having sidewalls and providing a housing front wall, and
   2. a cover having sidewalls and providing a housing rear wall;

B. a pair of spaced sockets, each including
   1. a pair of slots formed in said housing front wall, and
   2. a stab connector within said housing aligned with each said slot for achieving electrical contacting engagement with the prongs of an appliance cord plug inserted through said slots;

C. means forming a separate cavity in said base accommodating each said connector:

D. a pair of elongated, rigid busbars, each said busbar having its ends affixed to corresponding connectors of each said sockets;

E. a conductive strap affixed to each said busbar at locations intermediate their ends and extending transversely therefrom;

F. a stationary contact carried by each said strap adjacent its free end;

G. an operating mechanism mounted within said housing, said mechanism including
   1. a pair of movable contacts, and
   2. an arm carrying said movable contacts for movement between positions of electrical engagement and disengagement with respect to said stationary contacts, and

H. a GFCI module within said housing and controlling said operating mechanism such as to achieve disengagement of said stationary and movable contacts in the event of a ground fault.

4,001,653

APPARATUS FOR MECHANICALLY ASSISTING THE INSTALLATION AND REMOVAL OF AN ELECTRICAL DEVICE WITH RESPECT TO A SWITCHBOARD

William F. Olashaw, Plainville, and Frederick D. Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,639
Int. Cl.² H02B 1/04
U.S. Cl. 317—119 **16 Claims**

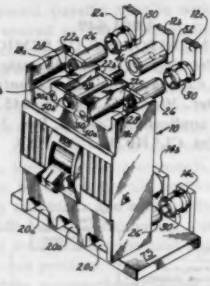
1. Apparatus for mechanically assisting the installation and removal of an electrical device with respect to a piece of electrical equipment, at least one set of associated device and equipment terminals being equipped with stab connector parts for plug-in electrical interengagement; said apparatus comprising, in combination:

A. first and second threadedly engageable parts;

B. at least one remaining device terminal unequipped with a stab connector part;

C. means retaining said first part in operative, registered relation with said remaining device terminal, said retaining means acommodating rotational motion of said part while limiting movement thereof relative to the device in the directions of movement of the device during installation and removal with respect to the electrical equipment;

D. at least one remaining equipment terminal associated with said remaining device terminal and likewise unequipped with a stab connector part; and



E. means fixedly mounting said second part to the electrical equipment in electrical connection with said remaining equipment terminal;

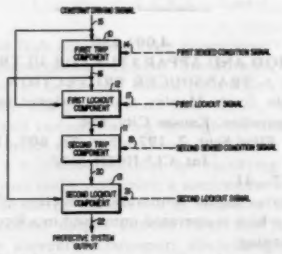
F. whereby, with said parts threadedly engaged, rotation of said first part in one direction forcibly draws the device toward the electrical equipment to electrically engage the associated stab connector parts, said parts also ultimately clamping said remaining device terminal in electrical connection with said remaining equipment terminal, and rotation of said first part in the opposite direction forcibly withdraws the device from the equipment to disengage the associated stab connector parts.

4,001,654

TESTABLE PROTECTIVE SYSTEM

Mark A. Davis, Orchard Park; Markus A. Eggenberger, and Jens Kure-Jensen, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 31, 1975, Ser. No. 600,835
Int. Cl.² H02H 3/00; H01H 47/00
U.S. Cl. 317—135 R **4 Claims**



1. In a testable protective system for detecting variations in a sensed condition of an operating system and taking action to protect said operating system, the combination of:

a first trip responsive to said sensed condition and providing an output indicative of variations of said sensed condition;

a first lock-out component serially connected to the output

of said first trip component, said first lock-out component including means for making the output of said protective system independent of the output of said first trip component when the first trip component is being tested;

a second trip component serially connected to the first lock-out component, said second trip component responsive to said sensed condition and providing an output indicative of said sensed condition;

a second lock-out component serially connected to the output of said second trip component, said second lock-out component including means for making the output of said protective system independent of the output of said second trip component when the second trip component is being tested;

wherein, said first and second trip components each comprise logical AND means; and,

said first and second lock-out components each comprise logical means performing the logical function characterized by the Boolean expression:

$$A\overline{C} + BC = D$$

where D is the output of the logical means and A, B and C are inputs thereto.

4,001,655

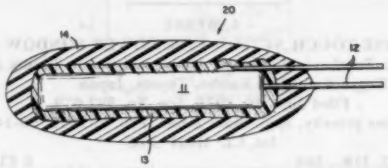
COMPRESSIBLE INTERMEDIATE LAYER FOR ENCAPSULATED ELECTRICAL DEVICES

Gerald A. Voyles, Indianapolis, and William D. Davies, Greencastle, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Jan. 10, 1974, Ser. No. 432,181

Int. Cl.² H01G *9/00*; **H01L** *23/28*; **H02G** *13/08*; **H05K** *5/00*

U.S. Cl. 317—230 **12 Claims**



1. A compressible and electrically insulative intermediate layer between a surface of an electrical component means and a protective coating, the intermediate layer including resin binder with void areas and solid filler material dispersed in the binder and over the surface of the electrical component means to help relieve compressive forces and other stresses that may be experienced by the electrical component means, the intermediate layer consisting of an effective amount up to about 25 wt.%, the remainder essentially solid filler selected from asbestos, mica, fibrous glass, calcined kaolin, silicon dioxide, nylon fiber, orlon, talc or mixtures thereof.

4,001,656

CAPACITOR HAVING A PLURALITY OF ANODE RISERS FOR LOW IMPEDANCE AT HIGH FREQUENCY

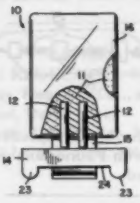
Gerald A. Voyles, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Dec. 27, 1974, Ser. No. 536,812

Int. Cl.² H01G *9/00*, *9/16*; **H01L** *23/28*

U.S. Cl. 317—230 **11 Claims**

1. A capacitor having low impedance at high frequency input signals comprising a body including a dielectric oxide film-forming metal containing anode with a myriad of intercommunicating voids, a cathode contacting the body, and a plurality of individual anode risers contacting the anode, each



of the anode risers extending from the anode in substantially the same direction.

4,001,657

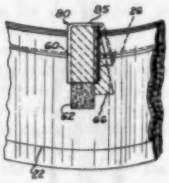
CAPACITORS HAVING INTEGRAL DISCHARGING MEANS

William M. Robinson, New Bedford, Mass., assignor to Cornell-Dubilier Electric Corporation, Newark, N.J.

Filed Apr. 16, 1975, Ser. No. 568,730

Int. Cl.² H01G *4/40*

U.S. Cl. 317—256 **16 Claims**



1. An electric capacitor comprising a winding of first and second electrodes and first and second strips of dielectric material separating said first and second electrodes forming a capacitor roll, and a resistive strip included as an integral part of the capacitor roll with first and second terminal portions of the resistive strip in physical and electrical contact with areas of said first and second electrodes, respectively, said resistive strip including a further portion connecting said first and second portions and extending as a loop about a lateral edge portion of at least one convolution of the winding and part of said further portion extending partway across the width of at least one of said electrodes, said capacitor having means electrically insulating said further portion of the resistive strip from the electrodes including means insulating said part of said further portion from the electrode or electrodes across which said part extends so that said resistive strip extends between the electrodes for discharging electrical energy that may be stored in the capacitor when it is disconnected from a source of power.

4,001,658

OSCILLATOR FOR NON-SINUSOIDAL MOVEMENTS

Helmuth Frenk, Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Germany

Continuation-in-part of Ser. No. 460,680, April 15, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,544

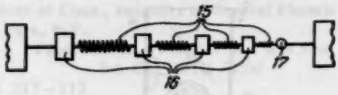
Claims priority, application Germany, Apr. 16, 1973, 2319224

Int. Cl.² H02K *33/00*

U.S. Cl. 318—37 **9 Claims**

1. A mechanical oscillator for generating a non-sinusoidal oscillatory motion by harmonic synthesis of a plurality of substantially sinusoidal oscillations, the oscillator comprising a plurality of mechanically intercalated resilient oscillatory

systems each comprising respective exciter drive means (15) drivingly coupled to a mechanically oscillatable element (16),



each oscillator system having a respective natural frequency chosen in accordance with Fourier analysis of the oscillatory motion to be synthesized.

4,001,659

APPARATUS FOR SPINNING A MICROELECTRONIC SUBSTRATE

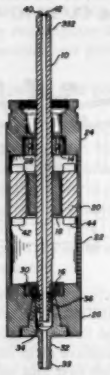
Vern D. Shipman, Garland, Tex., assignor to Headway Research, Inc., Garland, Tex.

Filed Sept. 12, 1974, Ser. No. 505,582

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H02K *33/00*

U.S. Cl. 318—119 **12 Claims**



1. Apparatus for spinning a microelectronic substrate, comprising:

a base for receiving and holding said substrate,

a two-phase motor having a first winding and a second winding and including a rotor coupled to said base, and

a control circuit including means for initially applying a phase reversing, low frequency voltage to the second winding of said motor and a DC voltage to the first winding to generate a reversing magnetic field and impart an oscillatory motion to the rotor, said control circuit further including means for timing the oscillatory motion of the rotor and applying a high frequency running voltage to the first and second windings to generate a revolving magnetic field to impart a rotating motion to said base.

4,001,660

REGULATING THE TORQUE OF AN INDUCTION MOTOR

Thomas A. Lipo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,009

Int. Cl.² H02P *5/40*

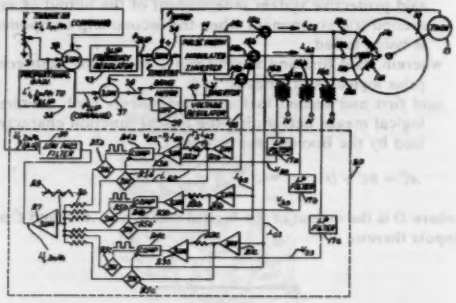
U.S. Cl. 318—227 **7 Claims**

1. A motor control circuit for regulating the torque of an induction motor having a stator winding and stator resistance comprising

a power converter for supplying adjustable frequency and amplitude voltage to a plurality of stator supply lines suitable for connection to said stator winding,

sensing means for continuously generating a plurality of instantaneous current and voltage sensor signals indicative of each instantaneous per phase stator supply line current and voltage,

first means for combining said instantaneous sensor signals for each phase to derive a modified voltage signal indicative of the respective stator voltage compensated for the voltage drop across said stator resistance, and second means responsive to the modified voltage signal for each phase and the respective instantaneous current sensor



signal for deriving a modified in-phase component of stator current signal representative of the component of stator current in phase with the compensated stator voltage, and

feedback control means for utilizing said modified in-phase component of stator current signal and command signals representing the desired torque and slip frequency to derive therefrom control signals for said power converter which are effective to regulate the torque of the induction motor.

4,001,661

ONE-TOUCH ACTION TYPE POWER WINDOW

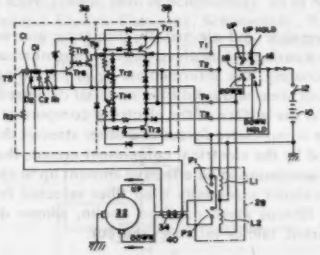
Gosaku Terabayashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 30, 1975, Ser. No. 592,079

Claims priority, application Japan, Feb. 6, 1975, 50-14887

Int. Cl.² H02P *3/08*

U.S. Cl. 318—264 **6 Claims**



1. A one-touch action type power window, comprising in combination:

a. A change-over switch connected to a power source and having a movable contact returnable automatically to a neutral position upon removal therefrom of an operating force and UP HOLD and DOWN HOLD contacts located opposingly on opposite sides of said movable contact;

b. a reversible motor connected to said UP and DOWN contacts to drive a window operator to raise or lower the window glass;

c. a retaining circuit having an input terminal connected to said UP HOLD and DOWN HOLD contacts and an output terminal to said motor and adapted to hold said motor

in an actuated state upon closing said change-over switch on said UP contact or DOWN contact and after said change-over switch is opened by removal therefrom of an operating force;

d. detecting means located close to a wire through which the operating current of said motor flows and adapted to generate a voltage varying in response to variations occurring in the magnetic field around said wire due to interruptions of said operating current; and

e. a control circuit having an input terminal connected to said detecting means and an output terminal to said retaining circuit and adapted to detect the rotational speed of said motor from said voltage variations and to actuate said retaining circuit only when said rotational speed of said motor is above a predetermined value.

4,001,662
VARIABLE CONTROL CURRENT GENERATOR ARRANGEMENT

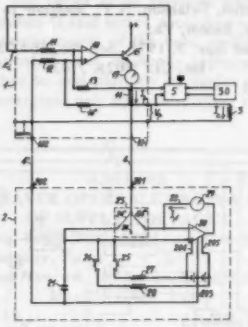
Jacques J. Le Gallais, Viry Chatillon, France, assignor to Societe Controle Bailey, Clamart, France

Filed Feb. 21, 1975, Ser. No. 551,547

Claims priority, application France, Feb. 28, 1974, 74.06912

Int. Cl.² G05B 9/02

U.S. Cl. 318—564 **2 Claims**



1. A variable control current generator arrangement for remotely controlling the current applied to a load component such as a servo motor comprising:

a main variable current generator connected to the terminals of said load component;

said main variable current generator comprising a first operational amplifier having input resistors connected to the input terminals thereof and a transistor amplifier cascaded with said first operational amplifier and having an output circuit including an output resistor and said load component;

feedback resistors respectively connecting the terminals of said output resistor to the input terminals of said first operational amplifier, the ratio between the input resistor values and the ratio between a feedback resistor value and the value of the serially connected output resistor and other feedback resistor being substantially equal, whereby said main variable current generator injects into the load component a current proportional to the voltage applied across its input resistors;

a second operational amplifier arranged in unity follower fashion;

an analog voltage store means permanently connected to the first input of said second operational amplifier; and

an inverter switch means selectively connecting the terminals of said load component to said analog store means and to the second input of said second operational amplifier, whereby the analog voltage store means stores the voltage drop across the load component and the second operational amplifier applies to the load component a current equal to the current applied thereto before the switching of the inverter switch means.

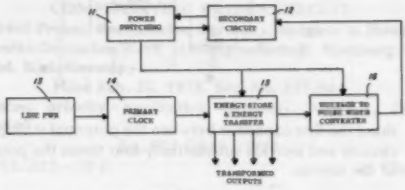
4,001,663
SWITCHING REGULATOR POWER SUPPLY

William Edward Bray, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 3, 1974, Ser. No. 502,703

Int. Cl.² G05F 1/64; H02P 13/24

U.S. Cl. 321—2 **39 Claims**



1. A switching regulator power supply for connection to a DC source of rectified AC power with a regulation cycle having an energy storage cycle and an energy transfer cycle, comprising:

a. timing means, for continuously providing a predetermined time period for the energy storage and a predetermined time period for the energy transfer cycle;

b. power switching means, connected to one side of the DC source and connected to the timing means to close and provide power during the energy storage cycle and to open during the energy transfer cycle;

c. a transformer having a primary winding with one end connected to the other side of the DC source and the other end connected to the power switching means to permit current to flow in one direction during the energy storage cycle and in the other direction during the energy transfer cycle and at least one secondary winding biased to permit current flow only during the energy transfer cycle;

d. indicating means operatively connected to the secondary winding to provide electrical signals indicative of secondary electrical power parameters the electrical signals including an end regulation cycle signal; and

e. first direct current coupling means, connected to the indicating means and to the timing means to couple the RCE signal to the timing means, the timing means being responsive to the RCE signal for adjusting the time of the energy storage cycle to a finite time more than zero.

4,001,664
D.C. POTENTIAL MULTIPLIER

Tom M. Hyltin, Dallas, Tex., assignor to Seiko Instruments Incorporated, Torrance, Calif.

Filed Mar. 3, 1975, Ser. No. 554,488

Int. Cl.² H02M 3/155

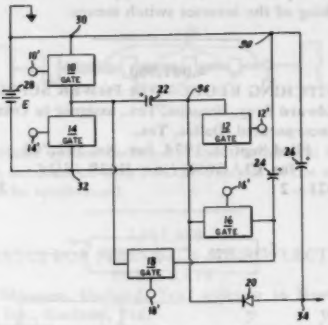
U.S. Cl. 321—15 **7 Claims**

1. A D.C. potential multiplier for multiplying the potential of a source comprising:

a first potential multiplying circuit connected to the source for multiplying the potential of the source, the first potential multiplying circuit including only one first capacitor;

a sequentially operated second potential multiplying circuit connected to the first potential multiplying circuit for multiplying the potential from the first potential multiplying circuit to provide an output potential from the potential multiplier, the second potential multiplying circuit including the first capacitor and only one other, second capacitor; and

means for switchably connecting the first capacitor into the first and second potential multiplying circuits to time



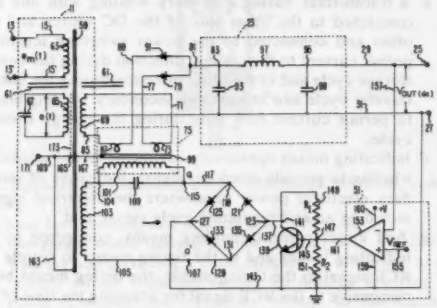
share the first capacitor between the potential multiplying circuits and provide substantially four times the potential of the source.

4,001,665

HIGH EFFICIENCY POWER SUPPLY HAVING A REACTIVE BUCK AUTOMATIC D.C. VOLTAGE REGULATOR

Daniel A. Wisner, Milan; Flavius A. Mathamel, Allen Park, and Truman T. Schmalzriedt, Westland, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 569,673
Int. Cl.² G05F *1/64*; H02P *13/04*
U.S. Cl. 321—18 **19 Claims**



1. A high-efficiency regulated power supply comprising:

ferroresonant transformer means for transforming an alternating current input signal, said ferroresonant transformer means including a core means, a primary input coil means coupled about said core means for receiving said alternating current input signal, a secondary coil means coupled about said core means and responsive to the alternating current input signal received by said primary coil means for generating a transformed secondary signal, a third coil means coupled about said core means and including a capacitor means connected in parallel across said coil means and tuned with said third coil means near the input frequency of said alternating current input signal for establishing ferroresonant and a centrally tapped winding within said secondary coil means having a central tap lead coupled to ground wwith one end of said centrally tapped secondary winding being serially connected to a first buck transformer secondary winding means and the other end of said centrally tapped secondary winding being serially coupled to a second buck transformer secondary coil means;

output means coupled to said secondary coil means for receiving said transformed secondary signal and outputting a regulated DC output signal, said output means including compensation means for varying said transformed secondary signal to ensure that said regulated DC output signal remains constant, said compensation means includes an auxiliary buck transformer means having a buck transformer secondary winding means connected in series with said secondary coil means for controllably bucking said transformed secondary signal and a buck transformery primary control winding means for controlling the amount of buck produced by said buck transformer secondary winding means, and said output means further includes an LC filter network for producing a DC output signal and rectifying diode means for coupling said buck transformery secondary winding means to said output filter means; and

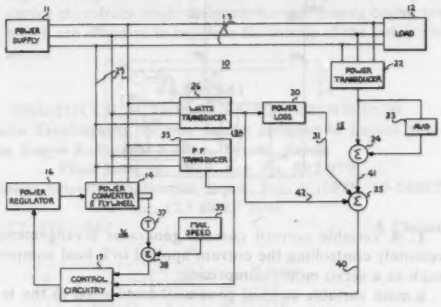
reactive control means responsive to real time changes in the alternating current input signal, in the parameters of the power supply itself, and in the load for simultaneously and rectively controlling said compensating means, said alternating current input signal and said transformed secondary signal for ensuring that said regulated DC output signal remains constant while minimizing power losses within said power supply.

4,001,666

LOAD PEAK SHAVER POWER REGULATING SYSTEM

K. Pascoe Grenfell, Delanson, N.Y., assignor to General Electric Company, Salem, Va.

Filed Apr. 3, 1975, Ser. No. 564,734
Int. Cl.² H02K *7/02*
U.S. Cl. 322—4 **7 Claims**



1. A power regulating system for a cyclically varying load comprising:

a. main power supply means connected to said load, said main power supply means being capable of supplying average power to said cyclically varying load and having a predetermined range about the average power within which range power excursions of short durations may permissibly occur;

b. means for measuring instantaneous power flow to said load;

c. means for measuring power to said load over a predetermined interval to obtain average power flow to said load;

d. means for comparing instantaneous power flow to said load with average load power to produce a difference signal representative of instantaneous power excursions from the average load;

e. auxiliary power supply means connected to said main power supply means; and,

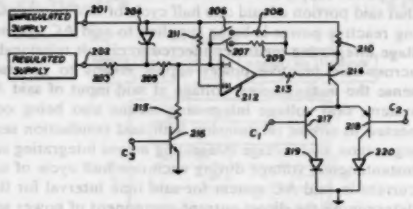
f. means responsive to said difference signal for regulating said auxiliary power supply means to continuously generate or absorb power in a predetermined percentage of the excursions of instantaneous power from average power.

4,001,667

CONSTANT CURRENT-PULSE LED DRIVE CIRCUIT

Robert E. Bober, Framingham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 462,696, April 22, 1974, Pat. No. 3,902,806. This application May 2, 1975, Ser. No. 574,184
Int. Cl.² G05F 1/20
U.S. Cl. 323—1 2 Claims



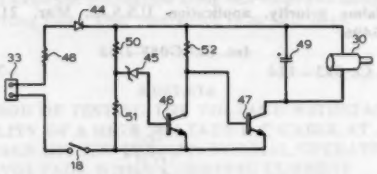
1. A circuit for supplying current drive to a plurality of light-emitting diodes, which may each require different drive-current, said circuit being capable of use with an oximeter system, said circuit comprising at least one electrical power supply, means for generating a series of current pulses from said supply, means for controlling the magnitude of each of said pulses of said series to be constant and equal to only certain other pulses of said series, according to the respective drive-current requirements of the light emitting diodes, and means for sequentially and cyclically applying said constant magnitude pulses to said plurality of diodes so that each of said diodes is energized only by pulses having the same magnitude.

4,001,668

ELECTRIC SHAVER OPERABLE FROM A WIDE RANGE OF SUPPLY VOLTAGES

Robert E. Lewis, Peach Bottom, Pa., assignor to Schick Incorporated, Lancaster, Pa.

Filed Nov. 16, 1973, Ser. No. 416,591
Int. Cl.² G05F 5/00
U.S. Cl. 323—19 12 Claims



1. In an electrical appliance of the type including a DC motor operable from an applied unidirectional current having a predetermined nominal voltage level, circuit means for operating said motor from an alternating current source having a predetermined range of voltage levels, said circuit means comprising, in combination:

energy storage means including a capacitor for producing from a series of applied current pulses having a predetermined peak voltage amplitude a unidirectional current at said predetermined nominal voltage level of said motor for application to said motor;

means including a switch device having main electrodes coupled between said alternating current source and said energy storage means and a control electrode for supplying current from said alternating current source to said energy storage means, the conduction state of said switch device being dependent on a control effect applied to said control electrode; and

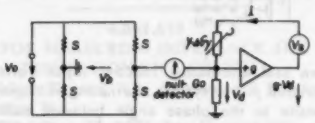
control circuit means responsive to the instantaneous voltage level of said alternating current source for applying a control effect to said control electrode, said control effect rendering said switch device conductive to apply current from said alternating current source to said energy storage means during those portions of the alternating current cycle when the instantaneous voltage level of said alternating current does not exceed said predetermined peak voltage amplitude, and non-conductive during those portions of the alternating current cycle when the instantaneous voltage level of said alternating current exceeds said predetermined peak voltage amplitude.

4,001,669

COMPENSATING BRIDGE CIRCUIT

Arnfried Preuss, Bordesholm, Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Germany

Filed Feb. 21, 1975, Ser. No. 551,942
Claims priority, application Germany, Mar. 1, 1974, 2409840
Int. Cl.² G01R 17/10
U.S. Cl. 323—75 C 15 Claims



1. A compensating bridge circuit for measuring physical quantities comprising:

a. an unbalanced Wheatstone bridge having a quantity-dependent voltage at an output thereof,

b. an ohmic potential divider means which produces a divisional voltage for compensating said quantity-dependent voltage,

c. said divider means including two resistant means one of which is variable,

d. means feeding an input voltage to the Wheatstone bridge, and

e. means providing a supply voltage to the potential divider means,

f. said supply voltage being composed of said bridge input voltage and said divisional voltage whereby, when the circuit system is balanced, the relationship between an input quantity x and a balancing quantity y is linear.

4,001,670

STATIC REACTIVE POWER GENERATING APPARATUS

Laszlo Gyugyi; John Rosa, and Eric J. Stacey, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1975, Ser. No. 575,888
Int. Cl.² H02J 3/18
U.S. Cl. 323—108 7 Claims

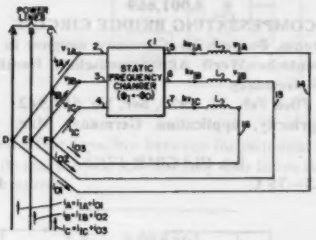
1. A reactive power generator coupled to an alternating current power system of given frequency including at least one alternating voltage source and a load, comprising:

a static frequency converter havng input and output terminals and including a plurality of controllable static switching devices connected between said input and output terminals, said input terminals being connected to said alternating current power system;

impedance means connected between said output terminals and said input terminals; and

control means for turning said static switching devices ON and OFF selectively and sequentially at predetermined instants of time to connect said input terminals to said output terminals in predetermined sequence for predetermined time intervals, and to derive at said output terminals an alternating voltage wave resulting from selected

segments of the alternating voltage wave of said alternating current power system, with said output terminal voltage wave having the same frequency as said power system voltage wave and having a difference in magnitude from the voltage of said power system voltage wave in an amount determined by said control means so that an alternating reactive input current flows from said alternating current power system into said input terminals and an alternating reactive output current flows from said output terminals into said alternating current power system through said impedance means the phase angle between said alternating reactive input current and the associated power system alternating voltages wave being opposite to the phase angle between said alternating reactive output current and the associated output terminal alternating voltage wave, whereby said reactive input current and said reactive output current are summed up directly at said input terminals to supply reactive power to said alternating current power system in an amount which is twice the volt-ampere throughput of said reactive power generator, the nature and amount of said supplied reactive power being determined by said voltage difference.

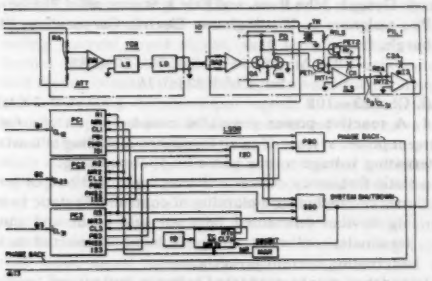


4,001,671

APPARATUS FOR PROVIDING FEEDBACK TO ELIMINATE A DC COMPONENT IN THE OUTPUT OF A STATIC VAR GENERATOR

Laszlo Gyugyi; Michael B. Brennen, and Eric J. Stacey, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,919
Int. Cl.² H02J 3/18
U.S. Cl. 323—119 **4 Claims**



1. A reactive power generator connected in parallel to the input of an AC system in which AC current flows for supplying compensating reactive power to said AC system, comprising:

switched reactive power supply means for supplying said compensating reactive power to said AC system for a portion of each one half cycle of said current in said AC system;

control means interconnected with said AC system and said reactive power supply means for periodically determining the amount of compensating reactive power which is necessary in said AC system during said half cycle to achieve compensation and for switching said reactive power supply means to a state which provides said necessary compensating reactive power to said AC system;

conduction sensing means connected to said switched reactive power supply means for determining the time interval that said portion of said one half cycle of said compensating reactive power is being supplied to said AC system,

voltage integrating means connected in circuit relationship across said reactive power supply means to generally sense the instantaneous voltage at said input of said AC system, said voltage integrating means also being connected in circuit relationship with said conduction sensing means, said voltage integrating means integrating said instantaneous voltage during each one half cycle of said current in said AC system for said time interval for thus determining the direct current component of power supplied by said switch reactive power supply means; and

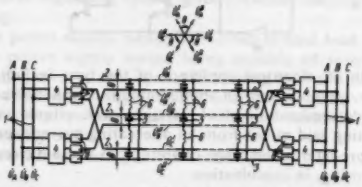
feedback means interconnected to said voltage integrating means and said control means for providing a signal which is related to said direct current component of said power in said control means to cause said control means to act to switch said reactive power means on at a different time to reduce said direct current component of said power in said reactive power means.

4,001,672

POLYPHASE AC POWER TRANSMISSION ARRANGEMENT WITH HOMOGENEOUS PHASES

Vitaly Mikhailovich Postolaty, ulitsa Demokraticheskaya, 6/1, kv. 58, Kishinev; Valentin Andreevich Venikov, ulitsa Novoslobodskaya, 67-69, kv. 62; Jury Nikolaevich Astakhov, ulitsa Gotvalda, 10-2, kv. 10, both of Moscow; Georgy Vladimirovich Chaly, bulvar Negrutsi, 5, kv. 12, and Lev Pavlovich Kalinin, ulitsa Stefana Velikogo, 51a, kv. 35, both of Kishinev, all of U.S.S.R.

Filed Mar. 19, 1975, Ser. No. 559,876
Claims priority, application U.S.S.R., Mar. 21, 1974, 2006496
Int. Cl.² G05F 1/68
U.S. Cl. 323—124 **7 Claims**

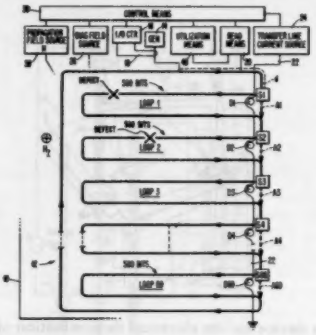


1. An alternating current power transmission arrangement, comprising at least two polyphase lines with homogeneous phases, said homogeneous phases having conductors separated by a minimum distance permissible for interphase overvoltages, phase control units at terminals of electric power transmission, the voltages of said homogeneous phases being shifted relative to each other to an angle differing from zero by said phase control units at the terminals of electric power transmission, said power transmission being controlled as a function of the power transmitted by a control system, the phase shift control improving the efficiency, duty and technical-economical parameters of the electric power transmission.

4,001,673
METHOD OF TESTING AND REPAIRING MAGNETIC BUBBLE DOMAIN CHIP

Gerald George Barrett, San Jose, Calif.; Louis Michael Hornung, and Calvin Coolidge Jones, Jr., both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,421
Int. Cl.² G01R *33/12*
U.S. Cl. 324—34 R **9 Claims**



1. A method of testing loops of a serial magnetic bubble domain chip having a propagation field applied thereto, and a repair station adjacent the entrance and exit of each of said loops, each repair station being initially loaded with a bubble domain creating shorting paths bypassing said loops, said method comprising:

a. sequentially generating a chain of bubble domains and propagating said chain until one of said bubble domains making up said chain is positioned adjacent said entrance of each of said loops;

b. transferring said bubble domains contained in said repair stations out of said repair stations into corresponding loops for propagation along said loops;

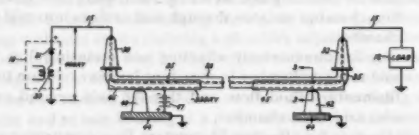
c. transferring said bubble domains positioned adjacent said entrance of said loops into said repair stations for recreating said shorting paths; and

d. reading said bubble domains that were transferred into said loops and propagated along said loops and along said shorting paths, after emergence from said loops.

4,001,674
METHOD OF TESTING THE VOLTAGE WITHSTAND ABILITY OF A HIGH VOLTAGE D-C CABLE AT A VOLTAGE HIGHER THAN ITS NORMAL OPERATING VOLTAGE WHILE CARRYING CURRENT

Harold N. Schneider, Springfield, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed July 29, 1975, Ser. No. 600,034
Int. Cl.² G01R *31/12*
U.S. Cl. 324—54 **3 Claims**



1. A method of testing a high voltage d-c cable at a voltage higher than its normal operating voltage while said cable is carrying current from its normal source of energization, said d-c cable comprising: a conductor for carrying said current that is normally operated at a predetermined voltage and polarity with respect to ground, a metal sheath surrounding said conductor that is normally at ground potential, and dielectric material between said conductor and said sheath that is stressed by the voltage present between said conductor and said sheath, said method comprising the steps of:

a. disconnecting said sheath from ground and providing insulation between said sheath and ground,

b. electrically biasing said sheath to a predetermined bias voltage with respect to ground, said bias voltage being of an opposite polarity with respect to ground as the normal operating voltage of said source,

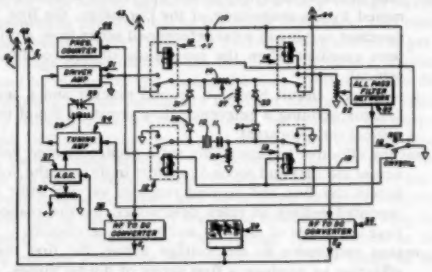
c. energizing said conductor with current and test voltage derived from said normal source, said test voltage being of the same polarity with respect to ground as said normal operating voltage and of a magnitude approximating that of said normal operating voltage, whereby the difference between said test voltage and said bias voltage is applied to said dielectric material, and

d. monitoring the condition of said dielectric material after said conductor has been energized as in (c) and said difference voltage has been applied to said dielectric material so as to determine whether said dielectric material can withstand said difference voltage without a breakdown while said conductor is carrying said current.

4,001,675
TEST SET FOR MEASURING IMPEDANCE AND POWER DISSIPATION OF A CRYSTAL

John R. Veleber, Towaco, N.J., assignor to R F L Industries, Inc., Boonton, N.J.

Filed Sept. 22, 1975, Ser. No. 615,380
Int. Cl.² G01R *29/22, 27/00*
U.S. Cl. 324—56 **2 Claims**



1. In a crystal test set of the type comprising an oscillator circuit which includes a crystal under test, an all pass filter network, and an a.c. driver amplifier connected to form a closed loop; means for adjusting the frequency of the oscillator circuit to cause the crystal to resonate; an adjustable substitution resistor; and means for inserting the resistor in the oscillator circuit in place of the crystal; the improvement comprising,

a. means automatically maintaining the driver amplifier output voltage at a predetermined constant level,

b. means developing a d.c. voltage E_1 equal to the output voltage of the driver amplifier which is applied to the crystal,

c. means developing a d.c. voltage E_2 equal to the output voltage of the crystal,

d. a differential amplifier receiving the voltages E_1 and E_2 and producing a difference voltage (E_1-E_2) which is the voltage across the crystal,

e. a voltage multiplier circuit,

f. circuit elements applying the voltages (E_1-E_2) and E_2 to said multiplier circuit, said circuit producing an output voltage (E_3-E_2) (E_2) which voltage is proportional to power dissipated in the crystal,

g. read out means having a scale calibrated in milliwatts and in ohms,

h. a d.c. voltage reference source,

i. means for connecting said read out means to the output of said multiplier circuit, and

j. means for connecting said read out means and said substitution resistor in series across the said voltage reference source.

4,001,676

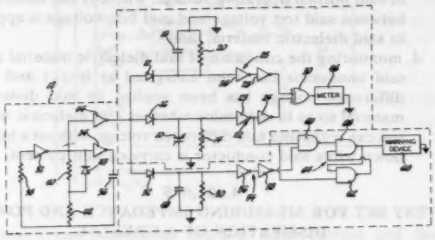
SOLID-STATE THRESHOLD DETECTOR

John W. Hile, Birmingham, and Paul R. Rabe, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1975, Ser. No. 608,076

Int. Cl.² G01R 27/26

U.S. Cl. 324—60 CD **2 Claims**



1. A threshold detector circuit for providing an indication of a critical magnitude of a condition, the circuit comprising:

a first circuit having a first reactor and a first resistor, at least one of which varies in accordance with the magnitude of the condition to define a first time constant determined by the magnitude of the condition, the first time constant varying in a predetermined sense from a critical time constant when the magnitude of the condition is critical;

a reference circuit having a second reactor and a second resistor defining a reference time constant equal to the critical time constant;

means effective to repeatedly set a predetermined voltage across the first and second reactors in unison, the voltage across the first and second reactors varying after each repeated setting at rates determined by the respective time constants of the first and reference circuits;

means responsive to the voltage across the first reactor effective to produce a first series of digital pulses, each digital pulse in the first series being coincident with a respective time period that the voltage across the first reactor varies in a predetermined sense from a predetermined voltage value which is attained during each cycle;

means responsive to the voltage across the second reactor effective to produce a second series of digital pulses, each digital pulse in the second series being coincident with a respective time period that the voltage across the second reactor varies in a predetermined sense from the predetermined voltage value which is attained during each cycle;

a logic gate means coupled to the means responsive to the voltage across the first reactor and the means responsive to the voltage across the second reactor and responsive to the sequence of termination of the digital pulses in the first and second series effective to generate a digital output signal which is initiated upon the termination of a digital pulse in one of the first and second series of digital pulses and terminated by the termination of the other one of the digital pulses in the first and second series when the sequence of termination of the digital pulses in the first and second series of digital pulses represents a time constant of the first circuit varying in the predetermined sense from the critical time constant; and

indicator means responsive to the output signal for providing an indication of the critical magnitude of the condition.

4,001,677

DEVICE FOR THE ELECTRICAL DETERMINATION OF TWO-DIMENSIONAL CO-ORDINATES OF A POINT

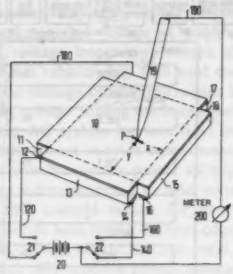
Peter Kleinschmidt, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 2, 1975, Ser. No. 592,525

Claims priority, application Germany, July 5, 1974, 2432324

Int. Cl.² G01R 27/02

U.S. Cl. 324—65 R **6 Claims**



1. In a device for the electrical determination of two-dimensional coordinates of a point on a plate with a scanning device which contacts the plate, and in which the plate comprises a resistance layer of a material having a given electrical resistance, and in which pairs of contact strips are arranged on the plate, each strip of a pair of strips being connected to a respective pole of an electrical voltage source, and in which a potential is tapped at the contact point of the plate and the scanning device and represents a gauge for the relative position of the contact point in relation to the contact strips, the improvement therein comprising:

varistor layers between the contact strips and the plate, and at least one voltage source for connection to the varistor layers for providing a voltage thereto which is greater than a threshold voltage at which the varistor layers pass from a state of low electrical conductivity into a state of greatly increased electrical conductivity.

4,001,678

DISPLACEMENT METERING WITH INDEPENDENT ANCILLARY FLOW

Robert H. Berg, 196 Clinton Ave., Elmhurst, Ill. 60126

Continuation-in-part of Ser. No. 470,396, May 16, 1974, abandoned. This application June 16, 1975, Ser. No. 587,287

Int. Cl.² G01N 27/00

U.S. Cl. 324—71 CP **23 Claims**

1. Displacement metering apparatus with two independently metered flows, especially adapted for use with a particle sensing instrument, comprising:

first, second and third fluid chambers;

coaxially aligned orifices in communicating series relationship comprising a first orifice connecting said first and second chambers and a second orifice connecting said second and third chambers;

means for effecting and metering filamentary flow from said first chamber seriatim through said orifices into said third chamber;

means for concurrently effecting and metering flow from said second chamber in sheathing laminar relation to said filamentary fluid flow and through said second orifice into said third chamber,

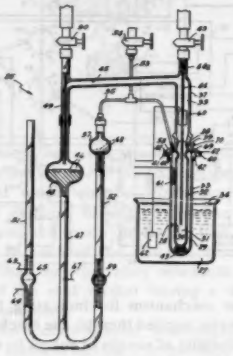
said means for effecting filamentary flow comprising a first tube connecting a communication with said third chamber and a first piston slidably mounted in said first tube;

said means for effecting a sheathing flow comprising a second tube connecting a communication with said second chamber and a second piston slidably mounted in said second tube; and

electric motor means connected to and concurrently operating said first and second pistons,

said electric motor means comprising an electric motor, and including a motor control connected to said electric motor,

said motor control comprising first means for energizing said electric motor to operate at a desired speed, second means for sensing a predetermined number of revolutions



of said motor and generating a start signal for the particle sensing apparatus, third means for sensing a second predetermined number of revolutions after the start signal to generate a stop signal for the particle sensing apparatus, and fourth means connected to said first means for comparing actual motor speed with respect to the desired speed and causing said first means to adjust the energization of the motor.

4,001,679

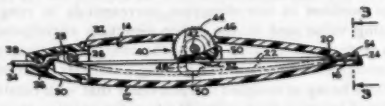
WEDGE ACTION ELECTRICAL TEST PROBE

William P. Cargile, 206 El Granada Blvd., Half Moon Bay, Calif. 94019, and W. Andrew Morrison, 12297 Via Roncole, Saratoga, Calif. 95070

Filed Feb. 19, 1975, Ser. No. 551,138

Int. Cl.² G01R *31/02;* **H01R** *13/00*

U.S. Cl. 324—72.5 **7 Claims**



1. A probe for effecting temporary electrical connection to one of two spaced apart terminals comprising a housing having a wall defining a cavity, an elongate insulative body rigid with said housing, said housing having an opening communicating with said cavity defining a shoulder adjacent said body, a conductive spring wire having a distal end extending through said opening, a medial region residing within said cavity and a remote end remote from said distal end, means for fixing said remote end to said housing at a point remote from said insulative body, and means for biasing said conductive body pivotally outward of said insulative body to afford wedging action between the two spaced apart terminals, said biasing means comprising means disposed in said housing for laterally deforming said medial region of said conductive spring within said cavity, said shoulder being longitudinally limited so as to afford pivotal movement of said conductive member relative said insulative member in response to deformation of said conductive spring by said deforming means.

4,001,680

DEVICE FOR MEASURING SMALL FREQUENCY DIFFERENCIES

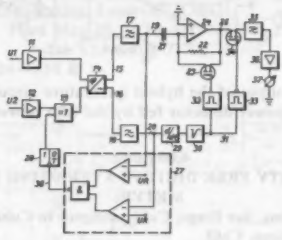
Per Gunnar Bylund, Spanga, and Bertil Lyberg, Norsborg, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 7, 1976, Ser. No. 647,173

Claims priority, application Sweden, Jan. 29, 1975, 7500935

Int. Cl.² G01R *23/02*

U.S. Cl. 324—78 Z **7 Claims**



1. A device for measuring small frequency differencies of the kind where the AC voltages, the frequency difference of which is to be measured, are squared and applied to a phase detector, the output signal of which is a ramp voltage having an amplitude proportional to the phase difference, said ramp voltage being differentiated in a differentiating circuit to get a DC voltage proportional to the frequency difference, characterized by means for decreasing the time constant of the differentiating circuit during any transient change in the linear ramp voltage, by switch means connected between the output of the differentiating circuit and a following low-pass filter said switch being arranged to disconnect the low-pass filter from the differentiating circuit during the time the latter has a decreased time constant, and by a phase shifter connected before one of the inputs of the phase detector for shifting the phase of the corresponding AC voltage 180° as soon as the ramp voltage amplitude falls outside the linear range of the ramp.

4,001,681

VECTOR VOLTMETER

Cletus A. Hoer, and Glenn F. Engen, both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 652,957

Int. Cl.² G01R *25/00*

U.S. Cl. 324—83 R **7 Claims**

1. A vector voltmeter for measuring first and second signals comprising:

a. a first power divider connected to the first signal;

b. a first power detector fed by the first power divider;

c. a second power divider fed by the second signal;

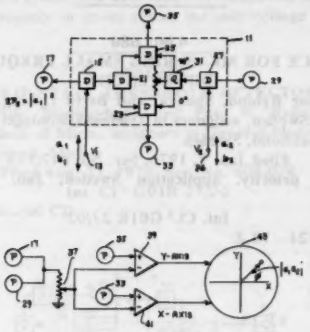
d. a second power detector fed by the second power divider;

e. a third power divider fed by the first power divider;

f. a hybrid quadrature circuit fed by the second power divider and having a 0° phase output and a 90° phase output;

g. a fourth power divider fed by the third power divider and the 0° phase output of the hybrid quadrature circuit;

h. a third power detector fed by the fourth power divider;
i. a fifth power divider fed by the third power divider and

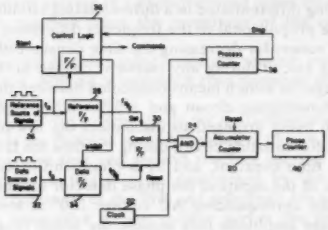


the 90° output of the hybrid quadrature circuit; and
j. a fourth power detector fed by the fifth power divider.

4,001,682
AMBIGUITY FREE DIGITAL AVERAGING PHASE METER

Richard E. Watt, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 293,107, Sept. 28, 1972, abandoned. This application Dec. 18, 1974, Ser. No. 530,691
Int. Cl.² G01R *25/00*
U.S. Cl. 324—83 D **8 Claims**



8. A digital system for measuring the phase difference between corresponding transitions of applied first and second signals having substantially the same frequency and for eliminating the phase measurement ambiguities that exist when corresponding transitions thereof are nearly coincident, said digital system comprising:

means for dividing the frequency of the applied first signal and the frequency of the applied second signal each by the same amount to produce respectively corresponding first and second output signals each having a corresponding lower frequency,

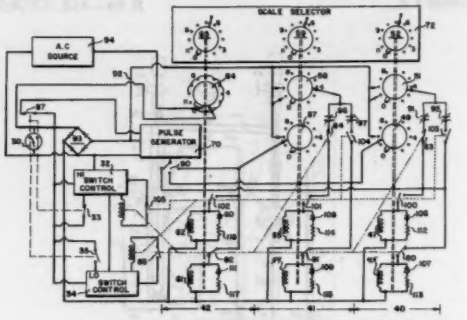
means for receiving the first and second output signals and measuring the phase difference between corresponding transitions of said divided first output signal and said divided second output signal over a predetermined plurality of successive cycles of said output signals, said means including apparatus for accumulating all the successive phase measurements of said predetermined plurality of cycles, and

means responsive to said first signal and coupled to said means for dividing, for inhibiting the producton of said second output signal for the first 180° of phase of said first signal during only the first cycle of said first signal during said plurality of successive cycles, whereby phase differences less than 180° have 360° added thereto for every cycle of said plurality of cycles

4,001,683
AUTOMATIC RANGE SELECTOR

Clyde E. McNeilly, Diamond Bar, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,878
Int. Cl.² G01R *15/08*
U.S. Cl. 324—115 **6 Claims**



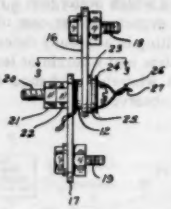
1. In a meter mechanism for indicating the value of an unknown parameter applied thereto, the mechanism including a scale with a plurality of ranges of values to which the meter mechanism can be made responsive at a particular instant, a range selector for developing an indication of the particular range of the scale which encompasses the value of the unknown parameter, and a scale selector coupled to the scale and the range selector and being responsive to the indication of the range selector to select the particular range of the scale and to make the meter mechanism responsive thereto, the improvement in the range selector, comprising: a meter relay coupled to said meter mechanism and being responsive to the value of the unknown parameter being outside the range to which the meter mechanism is then responsive to develop a high signal with the value of the unknown parameter of greater value and a low signal with the value of the unknown parameter of lesser value, and a plurality of stepping relays coupled in series to form a cascaded series of N relays, where N is an integer, said cascaded series being arranged in sequence from the first through the Nth relay, each of said N relays having a rotating portion with a number of contact positions, each combination of positions of all of the rotating portions of said stepping relays having associated therewith one of said ranges so that rotation of said rotating portion of any of said relays from one contact position to an adjacent contact position in one direction corresponds to ranges of increasing value and in the other direction corresponds to ranges of decreasing value, one of the contact positions of the first through said (N-1)th relays being a transfer position and said relays being so coupled to each other that with rotation of one of said rotating portions to the transfer position thereof in said one direction causes the rotating portion of the adjacent relay next higher in order in the order from said first through Nth relay to rotate to the next contact position thereof in said one direction and with rotation of one of said rotating portions to the transfer position thereof in said other direction causes the rotating portion of the adjacent relay next lower in order in the order from said first through Nth relay to rotate to the next contact position thereof in said other direction, a relay of said cascaded series being coupled to said meter relay and the scale selector and being responsive to said high signal to rotate the rotating portion thereof in said one direction to the next adjacent contact position and being responsive to said low signal to rotate the rotating portion in said other direction to the next adjacent contact position, the scale selector being responsive to the contact position of said rotating portion to make the meter mechanism responsive to the range associated with the combination of contact positions of said rotating portions.

4,001,684

CURRENT MEASURING SHUNT

David H. Fritts, 112 Beverly Place, Dayton, Ohio 45419

Filed Sept. 10, 1975, Ser. No. 612,069
Int. Cl.² G01R 15/00
U.S. Cl. 324—126 2 Claims



1. An inductively balanced shunt for measuring high frequency currents having a determined wavelength, comprising:

a. a first flat washer-shaped, non-magnetic, electrically conductive element having determined dimensions of outside diameter, inside diameter, and thickness. The magnitude of each of the said determined dimensions being less than approximately one-tenth the said wavelength, and the said washer having a determined first thickness resistance;

b. a second flat washer-shaped, non-magnetic, electrically conductive element having a determined outside diameter, a determined inside diameter, and a determined thickness, respectively, substantially the same as those of the said first washer-shaped element, and a determined second thickness resistance different in value from the said first thickness resistance;

c. means for axially aligning the said first and second washer-shaped elements, serially connecting the said first thickness resistance and the said second thickness resistance, and providing an electrical voltage connection contact at the said juncture; and

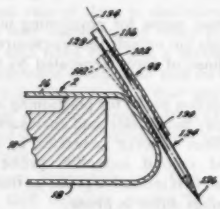
d. means for providing a current and a voltage contact to each of the said washer-shaped elements opposite the said juncture.

4,001,685

MICRO-CIRCUIT TEST PROBE

Jacques Leon Roch, Half Moon Bay, Calif., assignor to Electroglas, Inc., Santa Clara, Calif.

Division of Ser. No. 447,865, March 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,844, Jan. 28, 1974, Pat. No. 3,939,414. This application Oct. 11, 1974, Ser. No. 514,017
Int. Cl.² G01R 1/06, 31/02
U.S. Cl. 324—158 P 10 Claims



1. In a probe for testing integrated circuits which includes a support body, a probe tip positioned on the support body and conductive means to transmit an electrical signal to or from the probe tip, the improvement comprising:

a probe tip which includes a thin-walled tube which is shaped and positioned to receive a needle;

said thin-walled tube being bent at a bend line;

said thin-walled tube being resiliently straightened when a needle is inserted within the tube with the straightening of the tube creating a frictional force between the tube and the needle, and

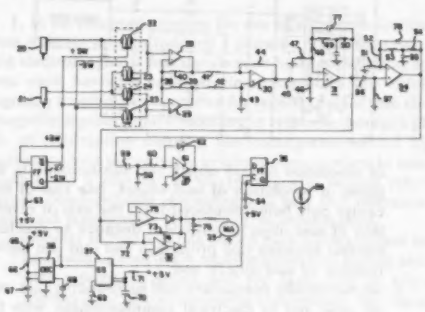
said tube havng a strength and resiliency to provide resilient straightening of the tube when a needle is inserted in the tube without exceeding the elastic limit of said tube to provide a frictional force between said tube and the needle which is sufficient to maintain the position of the needle with respect to the probe tip when the needle is brought into probing contact with a semiconductor surface having an integrated circuit defined thereon.

4,001,686

ELECTRONIC CIRCUIT TESTING APPARATUS

Frank A. Radichel, Thornton, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed May 28, 1975, Ser. No. 581,537
Int. Cl.² G01R 31/02, 31/08
U.S. Cl. 324—158 R 9 Claims



1. The method of locating a failing circuit connected by leads to a common node comprising:

applying first and second voltage probes to adjacent points on one of the leads connected to said node,

indicating the polarity of the voltage between said probes to determine the direction of current flow between said two points by setting a flip-flop in accordance with said direction of current flow,

simultaneously measuring the current flow between said two points,

successively applying said voltage probes to points on other leads connected to said node, and

repeating said indicating and measuring steps to determine the direction and magnitude of current flow in each of said leads.

4,001,687

ANGULAR VELOCITY INDICATING APPARATUS

Morris Sorkin, Santa Monica, and Jeffrey A. Oicles, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 422,224, Dec. 6, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,591
Int. Cl.² G01P 3/48
U.S. Cl. 324—173 8 Claims

1. The apparatus for generating a pulse train whose pulse repetition rate is in fixed relationship to the rotational speed of a rotating element of the drive train of a motor vehicle, comprising, in combination:

A. oscillator means for generating a substantially constant-frequency alternating signal;

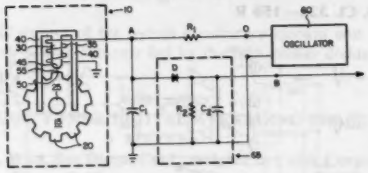
B. means for amplitude modulation of the signal from said oscillator means, the instantaneous envelope frequency of the modulation being in fixed relationship to the instantaneous rate of rotation of the element, said modula-

tion means comprising an electrical circuit responsive to the output of said oscillator means, said electrical circuit including:

1. variable inductance means, the rate of change of inductance of said variable inductance means being in fixed relationship to the instantaneous rate of rotation of the element, said variable inductance means comprising:

a. an object coupled to the rotating element of the motor vehicle drive train in such manner as to cause said object to rotate with an instantaneous rate of revolution in fixed relationship with the instantaneous rate of revolution of the element, said object having at least one projection oriented substantially radially with respect to the axis of revolution of said object, at least the extremity of said projection being of magnetic material;

b. an elongated center pole of magnetic material, said center pole oriented substantially radially to the axis



of revolution of said object and substantially in the plane of revolution of said object, one end of said center pole being displaced from the axis of revolution of said object a sufficient distance to preclude contact between said projection and said end during rotation of said object; and

c. an electrically conductive coil surrounding said center pole and in electrical communication with the output of said oscillator means; and

2. a capacitor connected with said variable inductance means, the capacitance of said capacitor being selected to tune said electrical circuit to said oscillator frequency when the inductance of said variable inductance means is at a maximum value; and

c. means responsive to the modulated signal and adapted to generate a train of pulses in response thereto, the instantaneous repetition rate of said pulses being in fixed relationship to the modulation frequency.

4,001,688

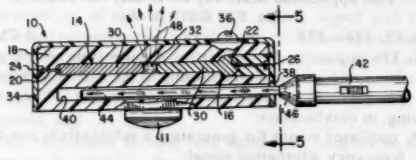
COULOMETER WITH END OF INTEGRATION COLOR CHANGE INDICATOR

Edward M. Marwell, Mount Kisco, and Jack C. Loh, White Plains, both of N.Y., assignors to Curtis Instruments, Inc., Mount Kisco, N.Y.

Continuation of Ser. No. 473,713, May 28, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 657,953

Int. Cl.² G04F *8/00*

U.S. Cl. 324—182 **10 Claims**



1. In a coulometric device comprising a body of nonconductive material having a capillary bore therein, a liquid metal disposed within said bore and an electrolyte for dividing said liquid metal into two columns within said bore, and a pair of electrical contact means each in ohmic contact with one of said two columns for enabling the application of a potential difference between the two columns to effect the electroplating of liquid metal from one of said columns to the other of said columns, the improvement wherein said electrolyte contains a component which is inactive during electroplating of said liquid metal and which undergoes a redox reaction when the liquid metal is depleted from one of the columns, said redox reaction resulting in a visually detectable change in the color of the electrolyte and wherein at least a portion of said body is translucent whereby a change in the color of the electrolyte may be observed.

4,001,689

DEVICE FOR INDICATING THE DIRECTION OF ROTATION OF A BODY DRIVEN BY A ROTATING ELECTRICAL MACHINE

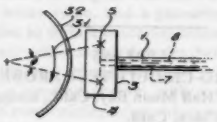
John Llewellyn Williams, Chester, and Phillip John Stokes, Liverpool, both of England, assignors to British Nuclear Fuels Limited, England

Filed July 2, 1975, Ser. No. 592,627

Claims priority, application United Kingdom, July 8, 1974, 30263/74

Int. Cl.² G01R *33/02*; G01B *7/00*

U.S. Cl. 324—34 D **4 Claims**



1. A device for indicating the direction of rotation of a body driven by a rotating electrical machine wherein the body and the machine are located within an enclosure, such device comprising:

a first inductive probe for positioning in proximity to the rotating body but outside said enclosure so as to interrupt magnetic lines of force generated by the electrical machine,

a second inductive probe for positioning in proximity to the rotating body but outside said enclosure so as to interrupt magnetic lines of force generated by the electrical machine, said second inductive probe being angularly spaced from first inductive probe so that signals produced by said probes differ in phase,

a detector circuit for sensing the difference in phase between the signals produced by said probes,

means for applying a selectively variable frequency signal to said detector circuit so as to provide variable discrimination for operating in differing speed ranges of said rotating body, and

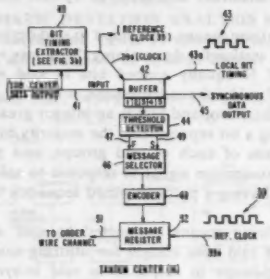
an indicator connected to said detector circuit for indicating the direction of rotation of said body.

4,001,690

METHOD AND APPARATUS FOR COMPENSATION OF DOPPLER EFFECTS IN SATELLITE COMMUNICATION SYSTEMS

Alfred Mack, Cherry Hill, and Cameron Charles Schweitzer, Stratford, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,163
Int. Cl.² H04B 7/19
U.S. Cl. 325—4 8 Claims



1. In a system of the type wherein a transmitting station transmits signals to an orbiting satellite relay station to be relayed thereby to a receiving station, wherein said transmitting station is capable of transmitting said signals at a plurality of controllable transmission rates, wherein relative motion between said satellite and said stations causes transmission delays between said stations and said satellite manifesting thereby a read in rate to said receiving station that is different from the transmission rate from said transmitting station, said receiving station comprising:

storage means having at least three storage locations for reading in bits of digital data received from said transmitting station and storing said bits in a predetermined location assignment, each location capable of storing a data bit,

means for reading out of said storage means at a fixed rate data bits stored therein in a sequence corresponding to the sequence of receipt of said data bits, said fixed rate being intermediate said plurality of controllable transmission rates,

means for detecting a difference in the read in rate and the fixed read out rate of data in said storage means, and generating a first output signal when said difference is greater than said fixed rate and a second output signal when said difference is less than said fixed rate,

output means responsive to said first and second output signals of said detector means for generating first and second control signals for transmission via said satellite to said transmitting station,

said output means generating said first control signal in response to said detector means first output signal, whereby said first control signal causes said transmitting station to reduce its rate of transmission,

said output means generating said second control signal in response to said detector means second output signal, whereby said second control signal causes said transmitting station to increase its rate of transmission,

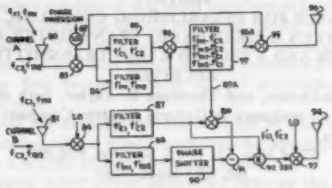
whereby said transmission delays between said transmitting and receiving stations and said satellite are minimized.

4,001,691

COMMUNICATIONS RELAY SYSTEM

Elliot L. Gruenberg, 6040 Boulevard East, West New York, N.J. 07093

Filed Jan. 30, 1975, Ser. No. 545,623
Int. Cl.² H04B 7/14
U.S. Cl. 325—14 14 Claims



1. In an electronic system for use in a communication system wherein there is radiated a plurality of information carrying electromagnetic first signals each having a radiating source and each having a radiated electromagnetic first reference signal, a transponder operative for receiving all of said electromagnetic signals and for radiating in response thereto a plurality of information carrying electromagnetic second signals corresponding respectively in information content to said first signals and a plurality of electromagnetic second reference signals corresponding respectively to said first reference signals, said transponder comprising, in combination:

a plurality of first antenna means each having output means and each operative for receiving said first signals and said first reference signals and for producing in response thereto a set of corresponding transmission line signals at its output means, and

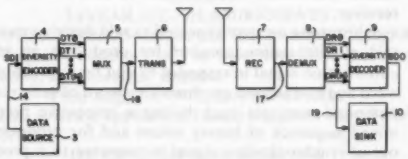
transmission means coupled to the output means of all of said first antenna means and operative for producing from said set of transmission line signals said second reference signals as well as said second signals, each of said second signals having a spatial electromagnetic power density distribution having a peak value in the direction of each of said sources except for the source for its corresponding first signal for sources angularly spaced apart with respect to said transponder.

4,001,692

TIME DIVERSITY DATA TRANSMISSION APPARATUS

Robert B. Fenwick, Palo Alto, and Clinton R. Gilliland, Menlo Park, both of Calif., assignors to Barry Research Corporation, Sunnyvale, Calif.

Filed July 7, 1975, Ser. No. 593,690
Int. Cl.² H04B 7/06
U.S. Cl. 325—38 R 25 Claims



24. In a data transmission apparatus, the method comprising:

successively and asynchronously delaying an input data stream to form at least three transmitter data streams having time diversity said transmitter data streams asynchronous to said input data stream,

transmitting said transmitter data streams,

receiving the transmitted transmitter data streams to form responsively receiver data streams having time diversity,

successively delaying the receiver data streams to remove the time diversity and form at least three in-phase data streams,

summing the in-phase data streams to form a sum data stream,

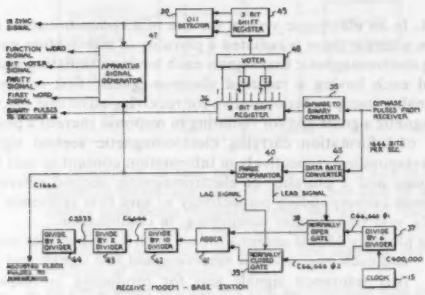
comparing the sum data stream with a threshold to form an output data stream.

4,001,693

APPARATUS FOR ESTABLISHING COMMUNICATION BETWEEN A FIRST RADIO TRANSMITTER AND RECEIVER AND A SECOND RADIO TRANSMITTER AND RECEIVER

Bill L. Stackhouse, and Theodore E. Taylor, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 12, 1975, Ser. No. 576,801
Int. Cl.² H04L 7/00
U.S. Cl. 325—58 **17 Claims**



1. For use in a radio communication system having at least a base station transmitter and receiver at one location and a mobile station transmitter and receiver at a second location, function control apparatus for establishing communication between said stations comprising:

a. means for for producing outbound messages having a sequence of binary bits at a first rate, each outbound message comprising a first synchronizing word of S bits, where S is an integer greater than two, a first address word, a second synchronizing word of S bits that is the binary inversion of said first synchronizing word, a second address word, a third synchronizing word of S bits that is the binary inversion of said first synchronizing word, and a command word;

b. means connected to said outbound message producing means and for connection to said base station transmitter for supplying said outbound messages thereto;

c. means for connection to said mobile station receiver for deriving said outbound messages transmitted by said base station transmitter and received by said mobile station receiver;

d. synchronizing means connected to said deriving means of said mobile station receiver for producing an in-synchronization signal in response to said first synchronizing word and said second synchronizing word of said received outbound messages each having a respective predetermined sequence of binary values and for producing an out-of-synchronization signal in response to a predetermined plurality of sequential synchronizing words of said received outbound messages each having a sequence of binary values that is different from its respective predetermined sequence of binary values;

e. means connected to said synchronizing means of said mobile station and connected to said deriving means of said mobile station for producing an inbound message in response to said in-synchronization signal and in response to said first and second address words of an outbound message having a predetermined sequence of binary values, said inbound message having a sequence of binary bits at a second rate that is greater than said first rate of said binary bits of said outbound messages, each inbound message comprising a synchronizing preamble, said first synchronizing word of S bits, said first address word, said second synchronizing word of S bits, said second address word, said third synchronizing word of S bits, and a response word;

f. means connected to said inbound message producing means and for connection to said mobile station transmitter for applying said inbound message thereto;

g. means for connection to said base station receiver for deriving an inbound message transmitted by said mobile station transmitter and received by said base station receiver;

h. synchronizing means connected to said deriving means of said base station for determining the binary values of each group of N equally spaced bits in said synchronizing words of said inbound message, where N is an integer greater than two, and S/N is an integer greater than one; producing a bit representing the majority binary value of said N bits of each of said groups; and producing an in-synchronization signal in response to said representative bits having a predetermined sequence of binary values;

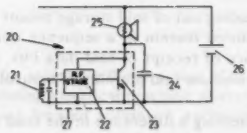
i. and utilizing means connected to said synchronizing means of said base station for utilizing said derived inbound message in response to said in-synchronization signal produced by said synchronizing means of said base station.

4,001,694

AUTOMATIC GAIN CONTROL CIRCUIT ARRANGEMENTS HAVING A PLURALITY OF STAGES OF AMPLIFICATION

David Latham Grundy, Saddleworth, and John Thompson, Manchester, both of England, assignors to Ferranti, Limited, Hollinwood, England

Continuation of Ser. No. 394,984, Sept. 7, 1973, abandoned. This application May 27, 1975, Ser. No. 580,566
Claims priority, application United Kingdom, Sept. 13, 1972, 42487/72
Int. Cl.² H04B 1/16
U.S. Cl. 325—319 **7 Claims**



1. An automatic gain control circuit arrangement having a plurality of stages of amplification comprising a first amplifier stage having input signal terminals connected to receive input signals and supply terminals connected to receive a supply voltage, a voltage divider connected across a power source, said voltage divider including a first impedance means and a second impedance means, said first and said second impedance means being serially connected, said second impedance means functioning as a second amplifier stage, a capacitor connected across said supply terminals, means for operatively connecting said second impedance means to said first amplifier stage to thereby provide a second stage of amplification for said input signal, said first impedance means providing a load impedance for said second stage, said second impedance means having an impedance value which varies inversely with the mean level of the output level of the first amplifier stage

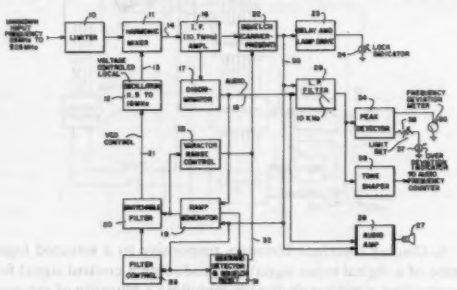
and being connected across said supply terminals of said first amplifier stage such that the signal voltage gain of said first stage is related to the magnitude of the supply voltage whereby a change in the mean level of an output signal from the first amplifier stage, caused by a change in the mean level of an input signal to said first stage, causes the value of said second impedance means to change and thereby cause a change in the total value of the series connected first and second impedance means such that the voltage applied to said supply terminals varies inversely with the mean level of the output signal from the first amplifier stage.

4,001,695

AUTOMATIC DEVIATION ANALYSIS METER

Benny A. Hrbacek, and Lewis F. Grovenstein, Jr., both of Concord, Calif., assignors to Systron Donner Corporation, Concord, Calif.

Filed Mar. 24, 1975, Ser. No. 561,091
Int. Cl.² G01R *23/16*
U.S. Cl. 325—363 **6 Claims**



1. An automatic deviation analysis meter for indicating the frequency deviation of an unknown frequency modulated carrier signal comprising: automatic transfer oscillator means including a harmonic mixer, a voltage controlled oscillator (VCO) for producing a local oscllator (L.O.) signal, a negative feedback loop including said harmonic mixer coupled to and responsive to the L.O. signal of said VCO to produce an intermediate frequency (I.F.) signal, said loop including a discriminator coupled to said harmonic mixer and responsive to said I.F. signal for producing a d.c. voltage determined by any I.F. signal frequency change, said d.c. voltage driving said VCO after acquisition of said carrier signal; search means for scanning said VCO during a scanning mode and before acquisition of said carrier signal; means for controlling the frequency response of said loop and responsive to acquisition of said carrier signal for providing a relatively slow loop response to maintain the L.O. signal substantially constant with relatively low audio frequency modulation on said acquired carrier such means also coupling said search means to said VCO during said scanning mode and providing a fast response.

4,001,696

ELECTRONIC ANTENNA

George Louis Bannerman, P.O. Box 577, Sharon, Conn. 06069

Filed Aug. 2, 1974, Ser. No. 494,306
Int. Cl.² H04B *1/18*
U.S. Cl. 325—373 **3 Claims**

1. An electronic antenna adapted to be used wth the conventional radio receiver having at least one tunable RF circuit, said antenna being tuned by said tunable RF circuit, and comprising:

a concealable electromagnetic pick-up,

an input transformer having primary and secondary windings, said pick-up being connected to said primary winding of said input transformer, and

broad band RF pre-amplifier means having an input coupled to said secondary winding of said input transformer and an output coupled to said tunable RF circuit in said conventional radio receiver as a load for selectively amplifying only the frequencies to which said tunable RF circuit is tuned,

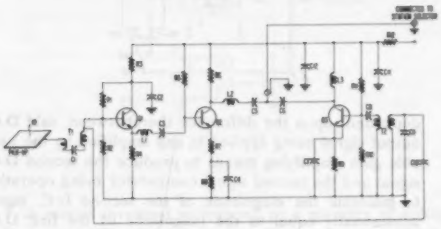
said conventional radio receiver being tunable over at least two different broadcast bands and including a separate tunable RF circuit for each broadcast band, said broad band RF pre-amplifier means comprising:

first pre-amplifier means directly connected to said secondary winding of said input transformer for amplifying signals in a first of said broadcast bands,

a first tuned circuit connected between the output of said first pre-amplifier means and the tunable RF circuit for the first broadcast band in said conventional radio receiver,

second pre-amplifier means coupled to said secondary winding of said input transformer for amplifying signals in a second of said broadcast bands, and

a second tuned circuit connected between the output of



said second pre-amplifier means and the tunable RF circuit for the second broadcast band in said conventional radio receiver, and

said at least two broadcast bands being the AM and FM broadcast bands, respectively, and said first preamplifier means comprises:

a first transistor having a base, a collector and an emitter, said base being directly connected to said secondary winding of said input transformer, said first transistor being connected as a grounded collector stage,

a second transistor having a base, a collector, and an emitter, said second transistor being connected as a common emitter stage,

a high impedance coupling circuit including an inductor and a capacitor connected in series between the emitter of said first transistor and the base of said second transistor, and

a high-pass filter connected in the emitter circuit of said second transistor to attenuate frequencies below said AM broadcast band.

4,001,697

LINEAR A.C. MEASUREMENTS

Paul Owen Withers, Swindon, and Eric Metcalf, Ropley, both of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Aug. 29, 1975, Ser. No. 609,320
Claims priority, application United Kingdom, Sept. 6, 1974, 39040/74
Int. Cl.² H02M *7/00;* **H03K** *5/00*
U.S. Cl. 328—26 **15 Claims**

1. An A.C. to D.C. conversion system comprising:

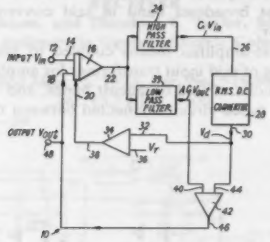
variable gain amplifying means for receiving and amplifying an A.C. input signal to be converted;

an A.C. to D.C. converter connected to receive the amplified A.C. signal from the variable gain amplifying means and arranged to convert the amplified A.C. signal to a first D.C. signal whose magnitude is dependent upon the magnitude of the amplified A.C. signal;

a first signal comparator arranged to compare the magni-

tude of the first D.C. signal with a reference magnitude and to produce a control signal dependent on the difference therebetween, the control signal being applied to the variable gain amplifying means to vary the gain thereof, whereby to change the magnitude of the amplified A.C. signal in the sense that tends to reduce the difference between the magnitude of the first D.C. signal and the reference magnitude; and

a second signal comparator arranged to compare the magnitude of said first D.C. signal with the magnitude of a second D.C. signal and to produce a D.C. output signal



dependent upon the difference therebetween, said D.C. output signal being applied to and amplified by the variable gain amplifying means to produce the second D.C. signal and the second signal comparator being operative to maintain the magnitude of the second D.C. signal substantially equal to the magnitude of the first D.C. signal;

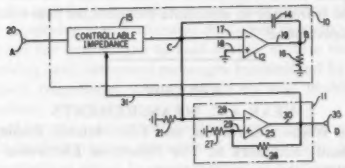
the ratio between the respective gains of the variable gain amplifying means for A.C. and D.C. signals being substantially constant, whereby the magnitude of the D.C. output signal is substantially linearly related to the magnitude of the A.C. input signal.

4,001,698

ANALOG TIMER INCLUDING CONTROLLABLE OPERATE-RECOVERY TIME CONSTANTS

Ralph Rabun Allred, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1975, Ser. No. 627,478
Int. Cl.² H03K *5/159*
U.S. Cl. 328—55 **8 Claims**



4. An analog timer of the type employed to generate an output pulse signal a predetermined time interval after application of an input pulse signal which includes an integrator circuit having a predetermined linear integration rate for developing a signal which is the mathematical integral of the input pulse signal, and a comparator circuit responsive to a difference between a signal developed by the integrator and a reference signal for generating the delayed output pulse, wherein the improvement comprises:

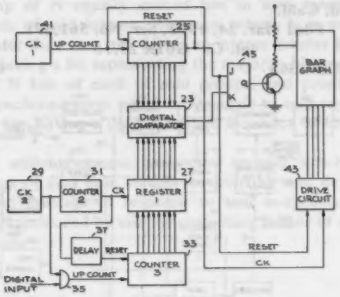
means connected in circuit with the integrator and being responsive to the output signal developed by the comparator for controlling changes in the integration rate of the integrator including controllable impedance means responsive to the applied input pulse signal and the comparator output signal for controllably changing the integrator integration rate in accordance with prescribed relationships of the applied input pulse signal and comparator output signal.

4,001,699

BAR GRAPH DIGITAL INTERFACE CIRCUIT

William Michael Denny, Santa Barbara; Russell Louis Hagen, Goleta, and Steve Ka-Lai Leung, Santa Barbara, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 15, 1975, Ser. No. 613,326
Int. Cl.² H03K *13/258, 17/100*
U.S. Cl. 328—71 **8 Claims**



1. Display interface circuitry responsive to a selected logic state of a digital input signal for producing a control signal for controlling a bar graph display including a plurality of sequentially activated cathode segments cooperating with a single anode element comprising:

first count producing means for producing a first count indicating the particular cathode segment under activation at any time;

second count producing means for producing a second count proportional to the duration of said digital signal in said selected logic state; and

means for comparing said first count to said second count and producing said control signal upon their equivalence;

said second count producing means including:

first clock means for producing a first clock signal having a frequency equal to the product of the total number of said plurality of cathode segments and 2^N where N equals an integer 0, 1, 2, 3 . . . ;

logic means supplied with said first clock signal for producing sampling clock pulses when said digital signal is in said selected logic state; and

first counter means for counting said sampling clock pulses; and

said first count producing means comprising:

second clock means for producing second clock pulses of a frequency equal to the produce of the total number of said plurality of cathode segments and the number of times per second said plurality of cathode segments is to be sequentially energized;

second counter means for counting a number of said second clock pulses equal to the total number of said plurality of cathode segments and thereafter resetting;

said second count producing means further including:

third counter means driven by said first clock signal for counting to the product of 2^N and the total number of said plurality of cathode elements and thereupon producing a reset signal;

register means responsive to said reset signal for storing at least the high order count bits of said second counter means necessary to represent the total number of said plurality of cathode elements; and

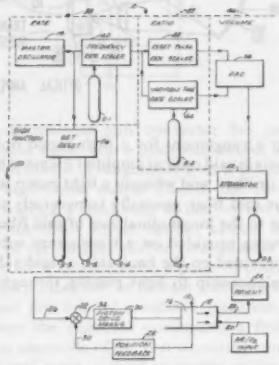
delay means activated by said reset signal for resetting said second counter means after said storing.

4,001,700

DIGITAL WAVEFORM GENERATOR FOR AUTOMATIC RESPIRATORY VENTILATORS

Albert M. Cook; Frank A. Engleman, Jr., and James G. Simes, all of Sacramento, Calif., assignors to Sutter Hospitals Medical Research Foundation, Sacramento, Calif.

Filed Apr. 16, 1974, Ser. No. 461,303
Int. Cl.[2] A03K *13/02*; H03K *21/18*; A61H *31/00*
U.S. Cl. 328—129 31 Claims



1. A system for digitally controlling an analog waveform signal to be used to control the respiratory cycle of a respirator in which the respiratory cycle has an inspiratory phase and an expiratory phase, the digital system comprising:

a. means for selecting a first input having a magnitude representative of a predetermined respiratory rate defining the duration for each respiratory cycle;

b. a digital respiratory rate circuit having means responsive to said first input for producing a first output comprising a series of time pulses having a frequency proportional to the magnitude of said first input;

c. means for selecting a second input having a magnitude representative of a predetermined respiratory ratio defining the duration of the inspiratory phase relative to the duration of the expiratory phase for each respiratory cycle, the magnitude of the second input being independent of the magnitude of the first input;

d. a digital respiratory ratio circuit for defining the inspiratory portion of each respiratory cycle, the ratio circuit having means responsive to the second input and to the output of the rate circuit for generating a second output comprising a constant number of timed pulses corresponding to the inspiratory phase of each respiratory cycle in which the portion of each cycle during which said constant number of pulses occur is proportional to said preselected respiratory ratio, and the frequency of said constant number of pulses is proportional to the frequency of pulses generated by the rate circuit, said constant number of pulses being independent of said preselected respiratory rate and ratio; and

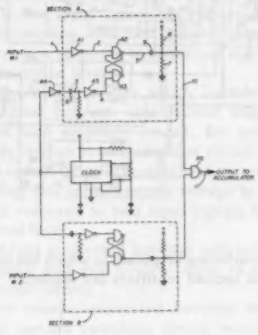
e. means responsive to the output pulses from the respiratory ratio circuit for converting said pulses into an analog waveform signal having magnitude with respect to time which varies in proportion to said preselected respiratory rate and ratio.

4,001,701

CIRCUIT FOR COMBINING PULSE TRAINS

John B. Rosso, and Sheyrl Wayne Garrett, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 25, 1975, Ser. No. 616,789
Int. Cl.[2] G06G *7/02*; H03K *3/78*
U.S. Cl. 328—158 3 Claims



1. A circuit arranged to respond to a plurality of voltage pulse trains and generate a single voltage pulse train which is an addition of the plurality of trains, including;

a first circuit section connected to a first of the input pulse trains, including,

a. a pair of logic gate circuits connected as a cross coupled latch and connected to receive the pulses of the input to the section and generate an output logic 1,

b. a connection between the output of an independent, stable source of voltage pulses and the cross coupled latch through which a first of the edges of the pulses shifts the latch output to logic 0.

c. and a resistance divider circuit means capacitively connected to said latch and responding to only the shift in the latch output to logic 0 to generate a voltage pulse in the output of the circuit;

and a second circuit section connected to a second of the input pulse trains which generates a voltage pulse in the output of the circuit with the second of the edges of the pulses of the stable source of voltage pulses,

whereby the differential source pulses generates a pulse train output of the circuit from the plurality of input pulse trains.

4,001,702

HIGH SPEED FM AND AM DEMODULATOR

Barry M. Kaufman, Pine Brook, N.J., assignor to R F L Industries, Inc., Boonton, N.J.

Filed Nov. 3, 1975, Ser. No. 628,569
Int. Cl.[2] H03D *3/00*, *5/00*
U.S. Cl. 329—135 8 Claims

1. A high speed FM demodulator for demodulating an incoming carrier frequency, which demodulator comprises,

a. a quadrature all-pass network,

b. a notch filter tuned to the carrier frequency,

c. means applying the carrier signal to said network and said filter,

d. a first summing amplifier,

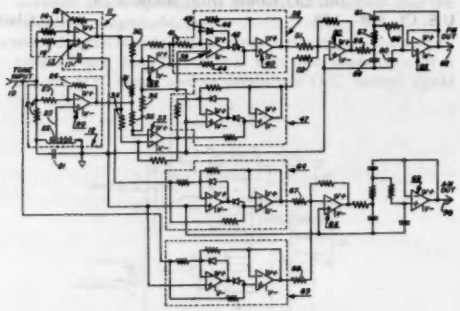
e. a first differencing amplifier,

f. means applying the outputs of said network and the notch filter to both the said first summing and said first differencing amplifiers,

g. first and second rectifiers,

h. means applying the output of said first summing amplifier to one of the said rectifiers,

i. means applying the output of said first differencing amplifier to the other of said rectifiers, and



j. a first combining amplifier to which the outputs of the said first and second rectifiers are applied.

4,001,703

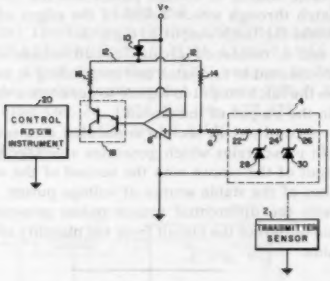
TRANSMISSION LINE INTERFACE CIRCUIT

Glenn Saul, Ambler, and Philip W. Bur, Horsham, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1975, Ser. No. 623,958

Int. Cl.² H03F 1/34

U.S. Cl. 330—1 A **6 Claims**



1. A transmission line interface circuit for interfacing between a remote grounded transmitter and a control room instrument, said interface circuit comprising an operational amplifier having a first and a second input terminal,

means deriving a first input signal for application to said first input terminal of said operational amplifier, said first input signal being proportional to the current drawn by the transmitter,

a current control means connected to be responsive to the output of said operational amplifier, and

means deriving a second input signal for application to said second input terminal of said operational amplifier, said second input signal being proportional to the current drawn by said current control means, said second input signal being applied to said operational amplifier in feedback relation whereby the current controlled by said current control means is a mirror image of the current drawn by said transmitter.

4,001,704

LASER SOLAR CELL APPARATUS

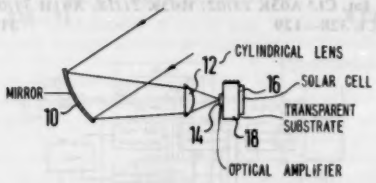
Hans-Gunter Danielmeyer, Hofingen; Jean Pierre Jeser, Stuttgart; Walter-Wolfgang Kruhler, Stuttgart; Karl-Heinz Thiemann, Stuggart, and Gunter Huber, Gerlingen, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Mar. 20, 1975, Ser. No. 560,149

Claims priority, application Germany, Mar. 25, 1974, 2414209

Int. Cl.² H01S 3/02

U.S. Cl. 330—4.3 **1 Claim**



1. A laser arrangement for a high-doped optical amplifier element wherein said optical amplifier element has the form of a thin layer or fiber, and wherein a light pump is directed onto said layer or said fiber generally transversely to a surface of said layer or to the longitudinal axis of said fiber said layer or said fiber being provided on a transparent substrate, a solar cell being provided on the back side of said substrate in light receiving relationship to light passing through said layer or fiber.

4,001,705

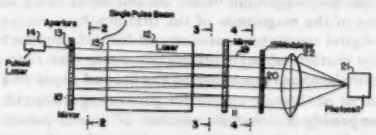
LIGHT SCANNING DEVICE

Brett Jason Sinclair, 150-11 72nd Road, Flushing, N.Y. 11367, and Harold Youngelson, 647 Academy St., New York, N.Y. 10034

Filed May 20, 1975, Ser. No. 579,271

Int. Cl.² H01S 3/00

U.S. Cl. 330—4.3 **5 Claims**



1. A light scanning device comprising, in combination, mirrors set to reflect a beam of light therebetween, a laser having a lasing medium in the path of light between at least two of said mirrors, means introducing a pulse beam between said mirrors, said mirrors reflecting said beam therebetween with said beam with each passage between said mirrors being slightly deflected, means directing a portion of said beam from between said mirrors to thereby direct a sequential pattern of light beams from said scanning device, said lasing medium amplifying said beam during reflection between said mirrors, and a modulator modifying the sequential pattern of light beams directed from said light scanning device.

4,001,706

SINGLE-ENDED/PUSH-PULL CONVERTER

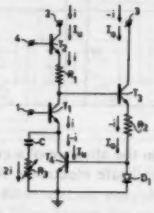
Albertus Prins, Moorebank, Australia, and Henri Jan Velo, Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,042

Claims priority, application Netherlands, Oct. 14, 1974, 7413448

Int. Cl.² H03F *3/04*

U.S. Cl. 330—14 **4 Claims**



1. A single-ended/push-pull converter for converting a single-ended input signal into a push-pull output signal, comprising a current mirror arrangement with a low-ohmic input circuit and a high-ohmic output circuit, the current in the output circuit bearing a fixed ratio to the current in the input circuit, a first transistor whose emitter circuit includes the output circuit of the current mirror arrangement and whose collector electrode is connected to a point of constant potential via the series connection of at least a first impedance and the base-emitter junction of a second transistor, of which second transistor the collector constitutes a first push-pull output, while an electrode of the first transistor constitutes the single-ended signal input, a third transistor of the same conductivity type as the first transistor, of which third transistor the emitter circuit includes a second impedance and the input circuit of the current mirror arrangement, and of which third transistor the base electrode is coupled to the collector electrode of the first transistor, and the collector constitutes a second push-pull output, and a d.c. blocking impedance which shunts the output circuit of the current mirror arrangement.

4,001,707

AMPLIFIER CIRCUIT

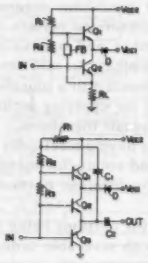
Shinsuke Iguchi, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed July 22, 1974, Ser. No. 490,341

Claims priority, application Japan, Jan. 11, 1974, 49-5964; Feb. 8, 1974, 49-15453

Int. Cl.² H03F *3/04*

U.S. Cl. 330—18 **6 Claims**



1. A circuit comprising:

an input terminal to which input signals to be amplified are coupled;

an output terminal from which output signals are derived;

an amplifier circuit connected between said input and output terminals, for amplifying said input signals and supplying the amplified signals at said output terminal;

a first supply voltage terminal for supplying a first supply voltage to said amplifier circuit;

a second supply voltage terminal for supplying a second supply voltage to said amplifier circuit, the absolute value of said second supply voltage being greater than the absolute value of said first supply voltage;

first switching circuit means, connected between said first supply voltage terminal and said amplifier circuit, for coupling said first supply voltage to said amplifier circuit in response to said input signals being below a prescribed level and decoupling said first supply voltage to said amplifier circuit in response to said input signals being at least said prescribed level;

second switching circuit means which includes a control input, connected between said second supply voltage terminal and said amplifier circuit, for coupling said second supply voltage to said amplifier circuit in response to said input signals being at least at said presecribed level and decoupling said second supply voltage to said amplifier circuit in response to said input signals being below said prescribed level;

first resistive means connected between said second supply voltage terminal and said control input of said second switching circuit means;

second resistive means connected between said control input of said second switching circuit means and said input terminal; and

positive feedback means connected between said output terminal and said control input of said second switching circuit means.

4,001,708

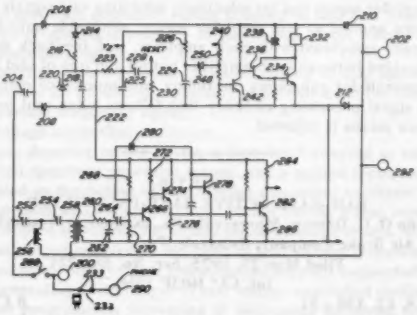
CODE-CONTROLLED RINGER ATTACHMENT FOR TELEPHONES INCLUDING A-PEAK-TO-PEAK GAIN CONTROLLED AMPLIFIER

Duane Ridgely Bolgiano, Bala Cynwyd, Pa., assignor to International Mobile Machines Corporation, Philadelphia, Pa.

Division of Ser. No. 496,450, Aug. 12, 1974, Pat. No. 3,936,617. This application Sept. 4, 1975, Ser. No. 610,127

Int. Cl.² H03G *3/30*

U.S. Cl. 330—29 **2 Claims**



1. A compression amplifier comprising a first transistor biased as an amplifier where the voltage gain is determined by emitter current which is inversely proportional to the base voltage, whereby any decrease in base voltage causes an increase in voltage gain, said first transistor being coupled through a second transistor connected as an emitter follower directly to a peak-to-peak detector circuit adapted to produce a decreasing voltage when the average peak-to-peak amplitude of the signal at the collector of said first transistor is greater than a threshold determined by said detector circuit

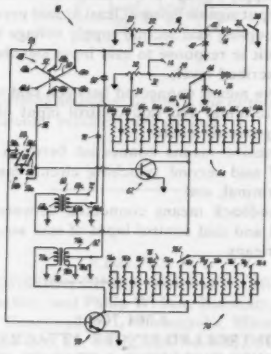
and to produce an increasing voltage when the average peak-to-peak amplitude of the signal at said collector is less than a threshold determined by said detector circuit, said detector circuit being coupled to the base of first transistor whereby the voltage gain of said first transistor is caused to adjust itself such that the peak-to-peak amplitude of the signal reproduced at the collector of said first transistor is substantially determined solely by the characteristics of said detector circuit.

4,001,709

ACTIVE DUAL CHANNEL TUNING CONTROL

Matthew Clinkscales, 508 Cleveland St., Brooklyn, N.Y. 11208

Filed Sept. 30, 1975, Ser. No. 618,272
Int. Cl.² H03F 3/68
U.S. Cl. 330—30 R **10 Claims**



1. A dual channel tuning circuit comprising two input terminal means each for receiving a different informational electrical signal; an amplifier provided in each channel and having an input and an output; switching means between said input terminal means and said amplifier inputs for selectively reversing said input terminal means with respect to each of said amplifier inputs and for selectively inhibiting said signals from being applied to said amplifier inputs; adjustable impedance means associated with each amplifier; and feedback means provided between each amplifier output and one of said input terminals for enhancing the tuning and impedance matching to signal processing circuitry that follows when said impedance means is adjusted.

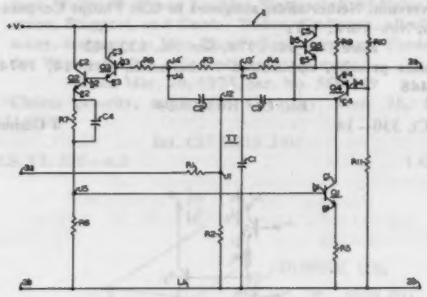
4,001,710

FAIL-SAFE ACTIVE BAND-PASS FILTER

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 27, 1975, Ser. No. 581,221
Int. Cl.² H03F 3/04
U.S. Cl. 330—31 **8 Claims**

1. A fail-safe electronic filter for passing a signal having a preselected frequency comprising, an amplifier having an input and an output circuit, a feedback path including an R-C twin-T network connected from said output circuit to said input circuit of said amplifier, an isolation circuit connected between said output circuit of said amplifier and said R-C twin-T network to prevent an increase in the gain of said amplifier due to an increase of resistance in said R-C twin-T network, said R-C twin-T network is imperfectly nulled to provide regeneration at said preselected frequency and to provide degeneration at all other frequencies from said output circuit to said input circuit of said amplifier so that an output signal is only available on an output terminal during the presence of said preselected frequency signal at said input circuit



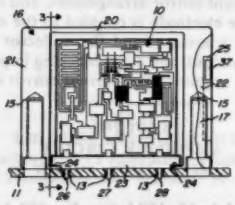
of said amplifier and in the absence of a critical component or circuit failure in the fail-safe electronic filter.

4,001,711

RADIO FREQUENCY POWER AMPLIFIER CONSTRUCTED AS HYBRID MICROELECTRONIC UNIT

William J. Knutson, Tamarac, and Daniel M. Smith, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1974, Ser. No. 492,306
Int. Cl.² H03F 1/00
U.S. Cl. 330—66 **12 Claims**



1. A self-contained power amplifier module constructed as a plug-in hybrid microelectronic unit with integral heat sink including in combination:

a flat ceramic substrate having a conducting coating on one side thereof and conductor means on the other side formed in a predetermined pattern to provide a plurality of conductor portions, and means connecting one portion of said conductor means to said conducting coating,

terminal means connected to a plurality of portions of said conductor means for applying input signals thereto and deriving output signals therefrom,

a semiconductor die having electrodes therewith secured to one portion of said conductor means, means connecting said electrodes to different portions of said conductor means,

one of said conductor portions being shaped to form a flat faced inductor with severable tuning segments for controlling the inductance, and

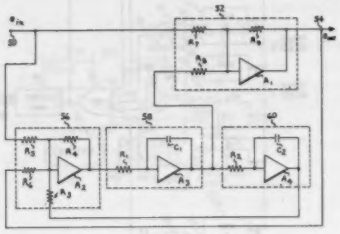
a conducting housing for said substrate having a portion for supporting said conducting coating and making direct electrical ground connection thereto, said housing serving as a heat sink by absorbing heat from said substrate by thermal conduction.

4,001,712

ACTIVE FILTER WITH INVERSE OPTION

George S. Chambers, Waynesboro, and L. Jubin Lane, Stuarts Draft, both of Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 18, 1975, Ser. No. 642,018
Int. Cl.² H03F 1/36
U.S. Cl. 330—85 8 Claims



1. An electronic filter circuit operable as either a band-reject or a band-pass filter having the same natural frequency of input signal comprising:

a. a first summing circuit for providing an output signal in response to first, second and third signals applied thereto through, respectively, first, second and third input resistors;

b. a first integrating circuit for providing an output in response to the output of said first summing circuit;

a second integrating circuit for providing an output in response to the output of said first integrating circuit;

a second summing circuit, responsive to said input signal and to the output of said first integrating circuit, to develop an output signal for said filter circuit; and,

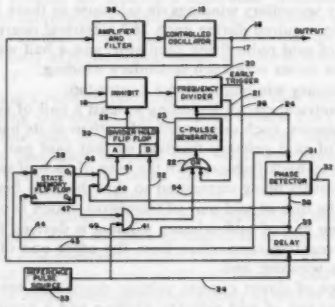
e. means for applying, respectively, as the signals applied to said first summing circuit through said first, second and third resistors, said input signal, the output from said second summing means, and the output of said second integrating means, said first and second resistors having first values when the filter circuit acts as a band-reject filter and having values interchanged from said first values when the filter circuit acts as a band-pass filter.

4,001,713

PHASE LOCK LOOP CIRCUIT

William F. Egan, Cupertino, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Jan. 15, 1976, Ser. No. 649,421
Int. Cl.² H03B 3/04
U.S. Cl. 331—1 A 3 Claims



1. A phase lock circuit for an oscillator having an output comprising

pulse generator means responsive to the output of said oscillator for producing controlled (C) pulses,

a phase detector having one input connected to the output of said pulse generator means,

a source of reference (R) pulses,

means for producing delayed R-pulses and applying same to said phase detector whereby the phase detector compares C-pulses and delayed R-pulses and produces an output corresponding to phase differences therebetween,

means to connect said output of the phase detector to said oscillator to correct changes in frequency of the latter relative to the frequency of said R-pulses,

means responsive to said C-pulses and to said delayed R-pulses for temporarily disconnecting the output of said oscillator from said pulse generator means when the C-pulse frequency is greater than said R-pulse frequency whereby to cause the second of two successive C-pulses that would occur prior to an R-pulse to occur immediately after the R-pulse, and

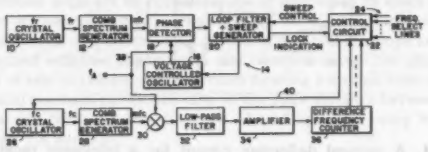
means responsive to said R-pulses for advancing the phase of the C-pulses when the C-pulse frequency is lower than said R-pulse frequency whereby to cause the second of two successive R-pulses that would occur without an intermediate C-pulse to be preceded by a C-pulse.

4,001,714

SEARCH AND CONFIRM FREQUENCY SYNTHESIZER

Francis K. Reed, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Nov. 12, 1975, Ser. No. 631,349
Int. Cl.² H03B 3/04
U.S. Cl. 331—4 3 Claims



1. Search and confirm frequency synthesizer apparatus comprising:

first means for generating a reference frequency signal;

second means for generating a comparison frequency signal;

first spectrum generator means coupled to said first means for producing a plurality of harmonics of the reference frequency signal;

second spectrum generator means coupled to said second means for producing a plurality of harmonics of the comparison frequency signal;

a voltage controlled oscillator;

phase detector means having a first input coupled to said first spectrum generator means, and a second input coupled to the output of said voltage controlled oscillator;

loop filter and sweep generator means having a first input coupled to the output of said phase detector means, and an output coupled to the input of said voltage controlled oscillator to provide a phase-locked loop for sequentially generating at the output of said voltage controlled oscillator progressively increasing or decreasing harmonic frequencies of said reference frequency signal;

frequency mixing means coupled to the output of said second spectrum generator means and to the output of said voltage controlled oscillator for mixing the plurality of harmonics of the comparison frequency signal with each sequentially generated harmonic of the reference frequency signal;

filtering means coupled to the output of said frequency mixing means for transmitting only the single, lowest frequency difference signal produced by said mixing means;

difference frequency counter means coupled to said filtering means for determining the frequency of said difference signal and for transmitting a numerical representation of the difference signal to a control circuit means; and

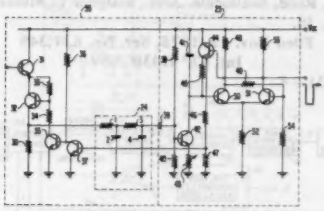
said control circuit means coupled to said difference frequency counter means, and said loop filter and sweep generator means, and having an input to receive an encoded frequency select input signal for comparing the numerical representation of the difference signal with the encoded frequency select input signal, and for controlling the operation of said phase-locked loop to produce an output signal having a frequency equal to a selected harmonic of said reference frequency signal.

4,001,715

VERTICAL DEFLECTION CIRCUIT FOR TELEVISION RECEIVER SET

Hirokazu Fukaya, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 8, 1975, Ser. No. 575,842
Claims priority, application Japan, May 8, 1974, 49-50953
Int. Cl.² H03B *3/06*
U.S. Cl. 331—20 **5 Claims**



1. A vertical deflection circuit for a television receiver comprising:

an input terminal receiving a composite synchronizing signal having a group of vertical synchronizing pulses;

means for producing a vertical trigger signal from said composite synchronizing signal fed through said input terminal;

a free-running oscillator capable of synchronous oscillation triggered by said vertical trigger signal, said free-running oscillator producing an output comprising vertical scanning period signals and vertical flyback period signals; and

a switching circuit located between said input terminal and said means for producing a vertical trigger signal, said switching circuit being adapted to prevent the application of said composite synchronizing signal to said means for producing a vertical trigger signal in response to said flyback period signals and to allow the application of said composite synchronizing signal to said means for producing a vertical trigger signal in response to said vertical scanning period signals.

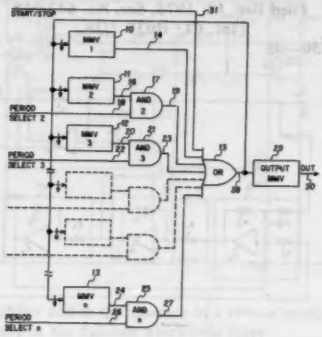
4,001,716

VARIABLE FREQUENCY DIGITAL OSCILLATOR

Ronald L. Swanson, and Lyle R. Strathman, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 17, 1976, Ser. No. 658,421
Int. Cl.² H03K *3/02*
U.S. Cl. 331—48 **9 Claims**

7. A digital oscillator comprising a plurality of retriggerable monostable multivibrators having discretely different output pulse widths, the output of the shortest pulse width one of said multivibrators comprising the output from said digital oscillator, feedback means applying the output of each multivibrator, exclusive of the output one of said multivibrators, as a triggering input to each of said multivibrators including the



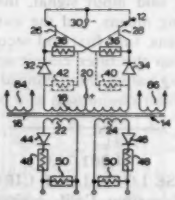
output one thereof, and means for initially triggering each of such multivibrators to develop an output from said output multivibrator the period of which is defined as the pulse duration time of the longest pulse width one of said multivibrators.

4,001,717

PULSE-FIRING POWER OSCILLATOR

Alfred Max Hase, 6 Manorwood Road, Scarborough, Ontario, Canada

Filed May 30, 1975, Ser. No. 582,199
Claims priority, application Canada, Feb. 7, 1975, 219624
Int. Cl.² H03K *3/30*
U.S. Cl. 331—55 **10 Claims**



1. A pulse firing power oscillator for producing a series of sequential firing pulses for SCR's being used in inverters and the like, where said oscillator comprises:

a non-saturating iron core having hysteresis characteristic;

a primary winding on said core;

as many secondary windings on said core as there are firing pulses required during each 360 electrical degree operation of said pulse-firing oscillator; and a half-wave rectifier in series with each secondary winding;

said primary winding having a centre-tap;

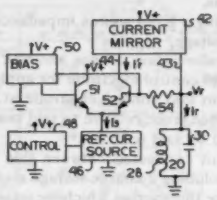
a symmetrical circuit including at least a pair of switchable transistors, each connected other than at its base to one end of said primary winding so that said pair are in a back-to-back fashion, with the base of each of said pair of transistors being connected so that the base bias voltage for the one of said pair of transistors which is connected to one end of said primary winding is derived through a non-reactive connection from the other end of said primary winding; and

a source of direct current voltage connected between the centre-tap of said primary winding and a common connection between said pair of switchable transistors, which common connection is further away from said centre-tap than the bases of said transistors.

4,001,718
LINEAR OSCILLATOR FOR PROXIMITY SENSOR

Michael A. Wilson; Gordon E. Gee, both of Sarasota, and Fred J. Momparler, Bradenton, all of Fla., assignors to Electro Corporation, Sarasota, Fla.

Filed May 12, 1975, Ser. No. 576,897
Int. Cl.² G01R 33/12; G08C 21/00
U.S. Cl. 331—65 16 Claims



1. In an oscillator having a series resonant circuit wherein the effective impedance and Q, and thus power loss at resonance, is a function of the distance of a part of the resonant circuit from a conductive body, the improvement comprising:

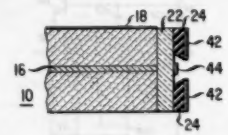
a source of current and voltage components of electrical power, the voltage component being substantially independent of changes of load impedance and Q; and

means for switching said power source across the resonant circuit, the power loss of said resonant circuit being directly proportional to the effective series resistance of the resonant circuit whereby current oscillations occur in said resonant circuit having an amplitude which varies inversely with the effective series resistance of the resonant circuit.

4,001,719
FABRICATION OF A SELF-ALIGNED MIRROR ON A SOLID-STATE LASER FOR CONTROLLING FILAMENTATION

Dan Charles Krupka, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 13, 1975, Ser. No. 604,089
Int. Cl.² H01S 3/02; G03C 5/00
U.S. Cl. 331—94.5 H 7 Claims



1. In a process for making a solid-state junction laser, a method for fabricating a small-area high-reflectivity region on one of the output faces of said laser to cause the laser to operate in only its fundamental mode, said method comprising the steps of

depositing a positive photoresist layer on said one face,

positioning one end of a single-mode optical fiber adjacent said one face to maximize optical power coupling between said laser and said fiber, said fiber comprising a core whose cross-sectional area is relatively small and a cladding disposed about said core,

directing sensitizing radiation into other end of said fiber to propagate along the core of said fiber to expose the portion of said photoresist layer that is in line with the core of said fiber, the cross-sectional area of said exposed portion corresponding approximately to that of said core,

removing the exposed portion of said photoresist layer thereby to provide an opening through said layer for access to a small-area portion of the one face of said laser,

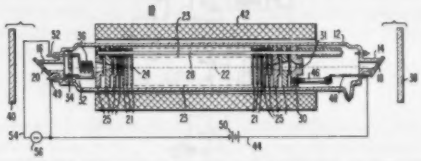
applying a high-reflectivity material to said remaining photoresist layer and through said opening onto said small-area portion of the one face of said laser, and

removing the remaining photoresist layer along with the high-reflectivity material applied thereto thereby to leave high-reflectivity material only on said small-area portion.

4,001,720
GAS LASER

Reno Raymond Carbonetta, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1975, Ser. No. 582,370
Int. Cl.² H01S 3/03
U.S. Cl. 331—94.5 G 3 Claims

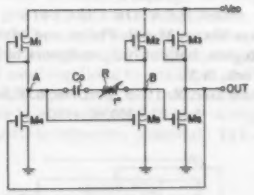


1. A laser device comprising a closed envelope, a gaseous filling within said envelope, a longitudinally extending array of carbon discs within said envelope each disc having an aperture through the central portion thereof, said discs being equally spaced from each other, said apertures being round with substantially equal diameters, the centers of said apertures being aligned on a common axis to form a straight line bore through said array of discs, a cathode electrode and an anode electrode adjacent to opposite ends of said array of discs to form a gaseous discharge through said bore, a first reflector aligned with said common axis at one end of said envelope and a second reflector aligned with said common axis at the other end of said envelope, said reflectors forming with said bore an optical resonant cavity, the ratio of the pitch distance between adjacent discs and the diameter of said aperture being between 1.8 and 3.0.

4,001,721
FIELD EFFECT TRANSISTOR MILLER INTEGRATOR OSCILLATOR WITH TEMPERATURE COMPENSATING IMPEDANCE

Minoru Fukuda, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 30, 1975, Ser. No. 627,281
Claims priority, application Japan, Oct. 30, 1974, 49-124399
Int. Cl.² H03K 3/353
U.S. Cl. 331—111 3 Claims



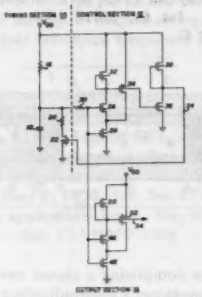
1. In an oscillation circuit wherein a plurality of inverters each composed of an FET for a load and an FET for drive are connected in cascade, a capacitor is connected between an input and an output of at least one of said inverters to thereby construct a Miller integrator, and an output of the final-stage inverter is applied to an input of the first-stage inverter, an oscillation circuit characterized in that impedance means having a positive temperature coefficient is connected in series with said capacitor.

4,001,722

INTEGRATED CIRCUIT RELAXATION OSCILLATOR

Suman H. Patel, Sunnyvale, Calif., and Thomas Jones, Glasgow, Scotland, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 19, 1975, Ser. No. 578,517
Int. Cl.² H03K 3/353
U.S. Cl. 331—111 **6 Claims**



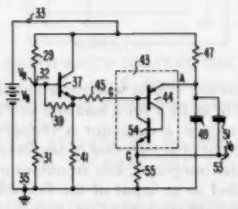
1. An oscillator comprising:
a. a capacitor,
b. a resistor connected in series with said capacitor and forming a conductive path for charging said capacitor,
c. means for discharging said capacitor, and
d. circuit means connected to said capacitor and having a relatively high trip point in a first state thereof wherein its output is at a relatively low level for disabling said discharging means while in said first state and a relatively low trip point in a second state thereof wherein its output is at a relatively high level for enabling said discharging means while in said second state, and further wherein said circuit means includes a first transistor having its input connected to said capacitor, and means responsive to the level of charge on said capacitor for biasing said first transistor with a first voltage which changes with and in the same direction as the charge on said capacitor, such that the trip point of the stage containing said first transistor is relatively high, and is further responsive to the conduction of said first transistor for biasing said first transistor with a second voltage which is substantially lower than the maximum amplitude of said first voltage.

4,001,723

OSCILLATOR CIRCUITS

Abel Ching Nam Sheng, Morris Plains, and Max Edward Malchow, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,846
Int. Cl.² H03K 4/50
U.S. Cl. 331—111 **13 Claims**



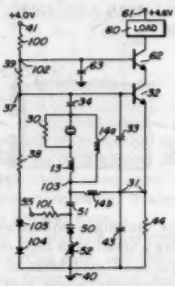
1. A relaxation oscillator comprising:
first and second terminals across which an operating voltage may be applied;
resistive means;
a solid-state switch having a control electrode receptive of a control voltage for operating said switch, and first and second electrodes defining a main current carrying path enabled by turn-on of said switch, said second electrode being connected to said second terminal through said resistive means;
a source exhibiting a given source impedance for providing a reference voltage;
impedance transformation means coupled between said source and said control electrode for applying said reference voltage to said control electrode at a substantially lower impedance level, relative to said control electrode, than exhibited by said source;
a charging circuit connected between said two terminals, said circuit including a charge storage element for developing a voltage thereacross which increases as a function of time;
a discharging circuit for said storage element comprising means for applying the voltage developed thereacross between said first electrode and said second terminal, said voltage causing said switch to turn on when it reaches a first value, and said switch turning off when said voltage reduces to a second value; and
a regenerative feedback circuit comprising a capacitor coupled between said first and second electrodes for supplying current to said resistive means in a sense to turn off said solid-state switch, upon discharge of said charge storage element.

4,001,724

VARIABLE HIGH FREQUENCY CRYSTAL OSCILLATOR

Anthony F. Keller, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 25, 1975, Ser. No. 590,245
Int. Cl.² H03B 5/36; H03C 3/22
U.S. Cl. 331—116 R **10 Claims**



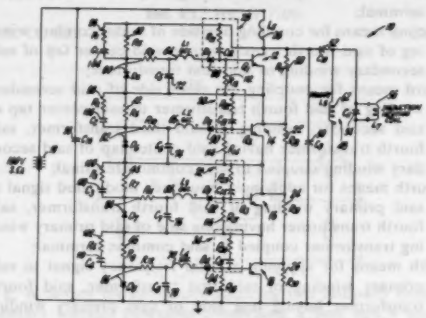
7. An improved variable, high frequency crystal oscillator comprising:
a. an oscillator having an electronic tank circuit including a crystal and a pair of capacitors which are connected in series as a capacitive voltage divider and are series coupled to said crystal, said crystal having a physical capacitance, C_o;
b. first and second inductance means;
c. means for coupling the first and second inductance means into the tank circuit for neutralizing the physical capacitance, C_o, of the crystal and for providing an impedance transformation between the crystal and the tank circuit operating as a load on the crystal; and
d. impedance varying means coupled into the tank circuit for varying the frequency of oscillation thereof.

4,001,725

HIGH POWER R.F. INDUCTION HEATING GENERATOR

Melvin Rossnick, Bronx, N.Y., assignor to Lepel High Frequency Laboratories, Inc., Maspeth, N.Y.

Filed Dec. 12, 1975, Ser. No. 640,283
Int. Cl.² H03B 5/12; H05B 5/08
U.S. Cl. 331—117 R 11 Claims



1. A high power R.F. induction heating generator for inductively heating a load, comprising:

a plurality of transistors of the same type series connected in a self-excited class "C" oscillator configuration;

a tank circuit including a tank coil electrically coupled between the output of said transistors and the load, and having an impedance which matches the output impedance of said transistors for providing an oscillating R.F. voltage signal to the load; and

feedback transformer means including a primary winding and a plurality of secondary windings corresponding in number to said plurality of transistors, said primary winding being coupled to said tank circuit and said secondary windings being uniformly wound over said primary winding and coupled to the bases of said transistors to provide input voltages of equal phase and amplitude to each of said transistors for synchronizing the conduction and non-conduction periods of said transistors for delivering equal shares of the total power to the load.

4,001,726

HIGH ACCURACY SWEEP OSCILLATOR SYSTEM

Wayne H. Sandford, Jr., Warrington, and Albert M. Bates, Southampton, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

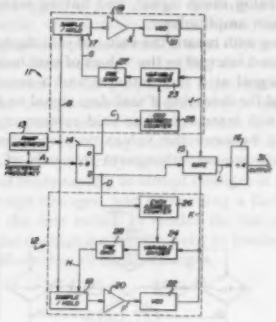
Filed Jan. 23, 1976, Ser. No. 651,876
Int. Cl.² H03B 23/00
U.S. Cl. 331—178 13 Claims

1. A sweep oscillator system for producing a series of signals of incrementally higher frequencies and equal duration from a reference frequency signal comprising: selector means receiving the reference frequency signal for producing

a timing signal indicative of a preselected duration; first and second phase-locked loops connected to receive the reference

frequency signal and said timing signal for alternatively producing

respective output signals of the incrementally higher frequencies; and gating means receiving said output signals and said timing signal, for



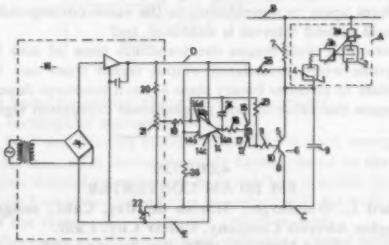
combining said output signals and producing at the output thereof the series of signals.

4,001,727

POWER CONTROL CIRCUIT FOR A POWER OSCILLATOR

Barrington George Kennett, and Adrian Ernest Miller, both of Paignton, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 7, 1975, Ser. No. 630,117
Claims priority, application United Kingdom, Dec. 3, 1974, 52247/74
Int. Cl.² H03B 3/14
U.S. Cl. 331—182 4 Claims



4. A power control arrangement for a power oscillator which arrangement includes a voltage catching diode connected to the grid of a power-oscillator tube, the catching voltage thereof being set by a shunt regulator comprising a differential amplifier with negative feedback applied from the cathode of said catching diode to one input and an adjustable reference potential applied to the other input, said negative feedback serving to maintain said catching voltage at the value set by said adjustable reference potential.

4,001,728

DIGITAL METHOD OF PULSE WIDTH MODULATION

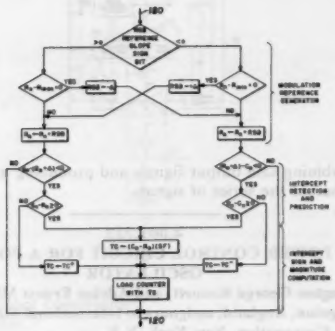
Wolfger Schneider, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1974, Ser. No. 446,258
Int. Cl.² H03K 7/08
U.S. Cl. 332—1 4 Claims

1. A method for producing a binary pulse width modulated output signal from an amplitude modulated digital data signal having a fixed frequency in accordance with detected times of

interception between said digital data signal and a reference signal, said method comprising the steps of: generating with means said reference signal in the form of uniform amplitude incrementations each of constant time interval to approximate as linear analog ramp signal, and having selected maximum and minimum amplitudes,

comparing with means the value of said digital data signal at a selected interval to the values of said incremental reference signal at a first interval and a second subsequent interval for detecting if said data signal and said reference signal will intercept when said reference signal is incremented between the values corresponding to said first and said second subsequent intervals of said reference signal,



generating with means a correction signal whose value is proportional to the time interval between the beginning of said first interval of said reference signal and the time at which said digital data signal would intercept said approximated linear analog ramp signal if an intercept between said digital data signal and said reference waveform upon incrementation to the value corresponding to said second interval is detected, and

controlling with means the transition time of said binary pulse width modulated output signal from one binary state to its other binary state at each intercept depending upon the value of said proportional correction signal.

4,001,729

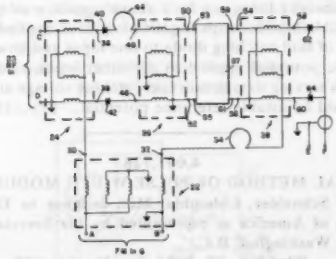
FM TO AM CONVERTER

Howard L. Weinberger, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 31, 1975, Ser. No. 563,888

Int. Cl.² H03C 1/50

U.S. Cl. 332—1 **7 Claims**



1. An FM to AM converter comprising, in combination:

first, second, third, and fourth transformers, each of said transformers having primary and center tapped secondary windings;

first non-linear circuit means for coupling the secondary winding of said first transformer to the secondary winding of said second transformer, said second transformer having said center tap of said secondary winding coupled to a common terminal;

first means for coupling said primary winding of said second transformer to the primary winding of said third transformer, said second and third transformers both having one side of said primary winding coupled to said common terminal;

second means for coupling one side of said secondary winding of said fourth transformer to said center tap of said secondary winding of said first transformer;

third means for coupling the other side of said secondary winding of said fourth transformer to said center tap of said secondary winding of said third transformer, said fourth transformer having said center tap of said secondary winding coupled to said common terminal;

fourth means for applying a frequency modulated signal to said primary winding of said fourth transformer, said fourth transformer having one side of said primary winding transformer coupled to said common terminal;

fifth means for applying a radio frequency signal to said primary winding of said first transformer, said fourth transformer having one side of said primary winding coupled to said common terminal; and

second non-linear circuit means for extracting an amplitude modulated signal from said secondary of said third transformer.

4,001,730

VARIABLE DIRECTIONAL COUPLER HAVING MOVABLE COUPLING LINES

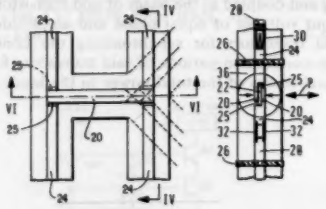
Georg Spinner, Erzgiessereistr. 33, 8 Munich 2, Germany

Filed July 16, 1975, Ser. No. 596,290

Claims priority, application Germany, July 16, 1974, 2434144

Int. Cl.² H01P 5/04, 5/18

U.S. Cl. 333—10 **9 Claims**



1. A directional coupler for adjusting the coupling attenuation by varying the air gap between the coupling lines to be coupled, said coupler comprising:

a first coupling line; first coaxial connection lines connected at opposite ends of said first coupling line; said first coaxial connection lines each extending away from said first coupling line in respective directions such that said first coaxial connection lines are generally in a plane;

a second coupling line; second coaxial connection lines connected at opposite ends of said second coupling line; said second coaxial connection lines each extending away from said coupling line in respective directions such that said second connection lines are generally in said plane;

said first and second coupling lines being positioned near each other, extending generally in the same direction over their entire lengths and being positioned such that they are separated from each other by a gap that is generally located in said plane; said first and second coupling lines being located at opposite sides of said gap and at opposite sides of said plane;

mechanical adjusting means connected with at least one of said coupling lines for adjusting the width of said gap between said coupling lines by moving said coupling lines relative to each other transversely to said plane.

4,001,731
DEVICE FOR OPTIONALLY REALIZING TWO MUTUALLY COMPLEMENTARY FUNCTIONS

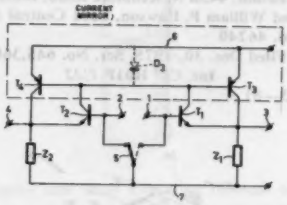
Robert Nestor Joseph Van Sluys, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 619,063

Claims priority, application Netherlands, Oct. 15, 1974, 7413514

Int. Cl.² H03G 7/06

U.S. Cl. 333—14 6 Claims



1. A device for optionally realizing two mutually complementary transfer functions comprising a first and a second impedance, a first and a second emitter follower circuit means for optionally applying an input voltage applied to said emitter follower circuits across the first and the second impedances respectively, a selection means for optionally maintaining one of the two emitter follower circuits in the conducting state, the two impedances being included in two separate signal circuits, and a current mirror arrangement means for selectively coupling the current which is produced in the associated impedance by the conducting emitter follower circuit to the other impedance.

4,001,732
CALIBRATION OSCILLATORS FOR NOISE REDUCTION SYSTEMS

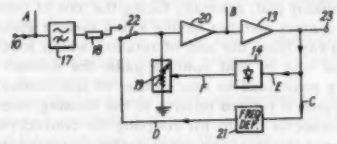
Kenneth James Gundry, London, England, assignor to Dolby Laboratories, Inc., San Francisco, Calif.

Continuation of Ser. No. 434,507, Jan. 18, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,315

Claims priority, application United Kingdom, Jan. 23, 1973, 3497/73

Int. Cl.² H04B 1/64; H03B 5/00

U.S. Cl. 333—14 3 Claims



1. In a signal compressor for compressing the dynamic range of an input signal, comprising a signal channel, a variable gain means arranged to vary the gain of the signal channel at least within a restricted frequency band, so as to effect compression of the dynamic range of the input signal amplifying means and rectifying and smoothing means coupled to the signal channel downstream of the variable gain means to derive a control signal, and means applying the control signal to the variable gain means to reduce the said gain in response to increase of input signal level, the improvement comprising a selectively operable positive feedback circuit, and a first switch having a first connection mode for normal operation of the compressor and a second connection mode operable to render ineffective the input signal to the compressor and to place the circuit in an oscillator mode by coupling the positive feedback circuit from the output to the input of the amplifying means to establish a closed positive feedback loop, and an oscillator output terminal coupled to a point in the positive feedback loop, the parameters of the positive feedback circuit being such that a signal is provided at the output terminal, in the oscillator mode, with a stable amplitude such as to provide a calibration signal at a predetermined level within the operating range of the compressor, for feeding to a recording or transmission channel for the purpose of adjusting the channel gain, for proper complementary expansion of signals compressed by said compressor when said switch is in said first connection mode, the rectifying and smoothing means including a circuit causing the rectifying and smoothing means normally to respond more rapidly to abrupt changes in signal level than to non-abrupt changes, and comprising a further switch operative with the first switch to render the last said circuit inoperative in the oscillator mode, thereby to render the speed of response uniform for all signal changes.

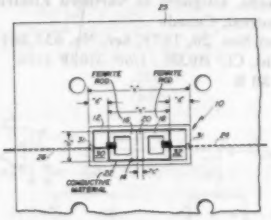
4,001,733
FERRITE PHASE SHIFTER HAVING CONDUCTIVE MATERIAL PLATED AROUND FERRITE ASSEMBLY

James D. Birch, Townsend; Max C. Mohr, Burlington, and Raymond C. Waterman, Jr., Townsend, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 18, 1975, Ser. No. 605,789

Int. Cl.² H01P 1/40

U.S. Cl. 333—24.1 4 Claims



1. A radio frequency phase shifter comprising:
a. a rectangular waveguide structure;
b. a four sided ferrite assembly disposed in such waveguide structure, such ferrite assembly having plated on the four sides thereof a conductive material, two opposite ones of such four plated sides being in contact with the wide walls of the rectangular waveguide structure; and,
c. wherein opposite ones of the remaining plated sides are displaced from the narrow wall of such waveguide structure.

4,001,734
π-LOOP PHASE BIT APPARATUS

Richard W. Burns, Orange, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

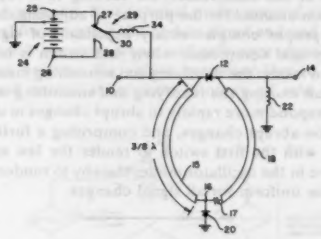
Filed Oct. 23, 1975, Ser. No. 625,271

Int. Cl.² H01P 1/18, 1/10; H03H 7/34

U.S. Cl. 333—31 R 7 Claims

1. An apparatus for selectively introducing a predetermined phase shift in a signal, said apparatus comprising a signal input terminal and a signal output terminal, a first unidirectionally conducting device connected from said signal input terminal to said signal output terminal; a first segment of transmission line connected from said signal input terminal to a first junction, said first segment of transmission line being greater than one-quarter wavelength and less than one-half wavelength long at the frequency of said signal; a second segment of transmission line connected from said output terminal to said first junction, the length of said second segment of transmission line being substantially equal to that of said first segment;

a second unidirectionally conducting device connected from said first junction to a second junction maintained at a substantially fixed direct-current reference potential; and means connected to said first and second segments of transmission line for simultaneously reverse biasing said first and second



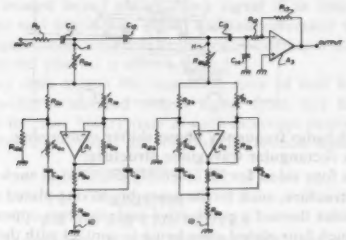
unidirectionally conducting devices to provide a reference phase shift in said signal or for simultaneously forward biasing said first and second unidirectionally conducting devices thereby to selectively increase said reference phase shift by said predetermined phase shift.

4,001,735

SINGLE AMPLIFIER IMMITTANCE NETWORK

Rudolph Hon-Ching Cheng, and Jin-Twan Lim, both of Kanata, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Nov. 20, 1975, Ser. No. 633,861
Int. Cl.² H03H 11/00; H03F 1/36
U.S. Cl. 333—80 R **8 Claims**



1. An immittance network comprising:
an input terminal and a common terminal;
an operational amplifier having an inverting input, a non-inverting input and an output;
first and second admittances (Y_1, Y_2) connected in series between said inverting and non-inverting inputs respectively;
a third admittance (Y_3) connected between said inverting input and said output;
fourth and fifth admittances (Y_4, Y_5) connected in series between said non-inverting input and said output respectively;
a sixth admittance (Y_6) connected between said common terminal and the junction of said fourth and fifth admittances (Y_4, Y_5);
a seventh admittance (Y_7) connected between said junction and said inverting input; and
an eighth admittance (Y_8) connected between the junction of the first and second admittances and the input terminal;
the values of said admittances having the relationship:

$$Z = \frac{1}{Y_8} +$$

-continued

$$\frac{Y_2Y_3Y_7 + Y_2Y_3Y_4 + Y_2Y_3Y_5 + Y_3Y_7Y_7 + Y_3Y_7Y_6 + Y_3Y_4Y_6 - Y_1Y_4Y_5}{Y_2Y_4Y_6(Y_1 + Y_8)}$$

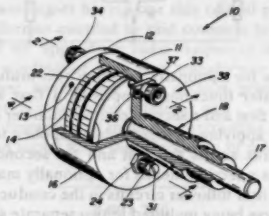
where: Z = the input impedance of the network across said terminals.

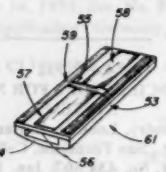
4,001,736

DIRECT CONTACT ROTARY ATTENUATOR

Bruce G. Malcolm, 4438 N. Kenmore Road, Indianapolis, Ind. 46226, and William P. Dawson, 9201 Central Ave., Indianapolis, Ind. 46240

Filed Dec. 30, 1975, Ser. No. 645,360
Int. Cl.² H01P 1/22
U.S. Cl. 333—81 A **14 Claims**





1. A rotary attenuator comprising:
a housing;
a rotor rotatably mounted in the housing and having an axis of rotation;
a plurality of attenuator elements mounted on the rotor, each said element having an attenuator pad and a first surface bearing a contact pad, electrically coupled to the attenuator pad, generally facing the axis of rotation;
a first contact member having a first surface generally facing away from the axis of rotation which touches a selected one of said contact pads, the contact member being positioned to touch other of said contact pads as the rotor is rotated relative to the housing; and
first connector means for coupling the contact member to external electronic circuitry and for mounting the contact member relative to the housing.

4,001,737

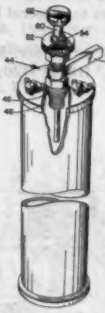
CAVITY TUNING ASSEMBLY HAVING COARSE AND FINE TUNING MEANS

James E. Scott, Austell, Ga., assignor to The United States of America as represented by the Field Operations Bureau of the Federal Communications Commission

Filed Oct. 24, 1975, Ser. No. 625,747
Int. Cl.² H01P 7/06
U.S. Cl. 333—83 R **9 Claims**

1. In a tuned resonant frequency cavity having an outside cylinder, a top plate and a bottom plate connected to said cylinder, said top plate having a tapped center hole, the improvement in said tuned resonant frequency cavity comprising

means coupled to a smooth shaft for coarse tuning said cavity and a further means coupled to said smooth shaft for fine



tuning said cavity said shaft extending through said tapped hole.

4,001,738

CIRCUIT INTERRUPTER HAVING AN ELECTROMAGNETIC REPULSION DEVICE

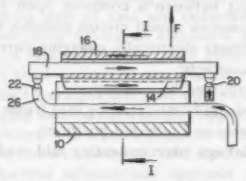
Claude Terracol, Eybens, and Pierre Schueller, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed June 30, 1975, Ser. No. 592,017

Claims priority, application France, July 12, 1974, 74.24460

Int. Cl.² H01H 75/10, 77/10

U.S. Cl. 335—16 2 Claims



1. A circuit interrupter having separable contacts and an electromagnetic repulsion device causing under predetermined fault-current conditions the separation of said contacts by imparting motion to a movable contact means of said contacts, said device comprising:

a magnetic circuit having closely spaced apart confronting pole faces defining a linearly extending air gap of small width therebetween,

terminal conductor means supplying current to said circuit interrupter and linked with said magnetic circuit in magneticfield generating relation therewith,

said movable contact means supporting an elongated conducting induction plate extending lengthwise between said pole faces in said air gap when said movable contact means is in closed-circuit position,

said movable contact means defining therein a main current path for the current flowing under normal-service conditions through said movable contact means in the closed-circuit position thereof, said main current path extending adjacent said air gap outside said magnetic circuit in non-linked relation therewith,

said movable contact means further defining a conducting portion linearly coextensive with said induction plate and located outside said air gap and said magnetic circuit in nonlinked relation with the latter to provide a return path for currents induced in said induction plate in such a manner that an abrupt rising of said fault current and the resulting rising of the magnitude of the magnetic field generated in said air gap by said terminal conductor means induce in said induction plate a secondary current linking said magnetic field and tending to repel said induction plate from said air gap to cause said moveable contact means to move away from said magnetic circuit.

4,001,739

CIRCUIT BREAKER WITH BELL ALARM AND BREAKER LOCKOUT ACCESSORY

David B. Powell, and Vincent P. Acampora, both of Bristol, Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,148

Int. Cl.² H01H 77/06

U.S. Cl. 335—34 10 Claims

1. An electric circuit breaker comprising, in combination:

A. a contact operating mechanism manually operable to ON, OFF and reset conditions;

B. a latching mechanism including latching means mounted for movement between latching and unlatching positions, said latching means, while in its latching position, latchably retain said operating mechanism in its ON and reset conditions;

C. an overcurrent trip unit;

D. a trip solenoid including a plunger movable upon energization of said solenoid under the control of said trip unit from an inactive position to an active position, said plunger in moving to its active position impacting against and shifting said latching means from its latching position to its unlatching position releasing said operating mechanism for automatic movement from its ON to its OFF conditions;

E. a lockout accessory associated with said latching mechanism,

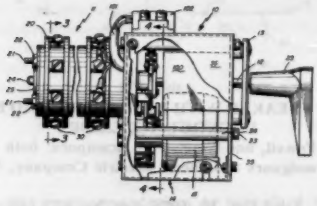
1. said accessory including a lockout member mounted for movement between inactive and active positions, said lockout member positioned to be shifted from its inactive position to its active position by said plunger as the latter shifts said latching means from its latching to its unlatching position, said lockout member, while in its active position, engaging said latching means to sustain the latter in its unlatching position, and

2. a latching member operative to automatically latch said lockout member in its active position as it is shifted thereto by said solenoid.

4,001,740
CONTROL SWITCH RELAY AND CONTROL CIRCUIT MEANS

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corporation, Weymouth, Mass.

Filed June 27, 1975, Ser. No. 591,170
Int. Cl.² H01H 3/28
U.S. Cl. 335—73 14 Claims



1. A control switch comprising,
a switch shaft mounted for reciprocal rotational movement about its axis from a first rest position to a second clockwise position and a third counterclockwise position,
a cam profile means fixed to the shaft and having first and second cam surfaces,
means for retaining said cam profile means with said shaft in said first rest position,
and drive means comprising means for selectively engaging said first and second cam surfaces to drive said switch shaft to said second and third positions respectively.

4,001,741
LOW WORKING TEMPERATURE REED GLASSES

Otto Lindig, and Werner Sack, both of Mainz, Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Jan. 28, 1976, Ser. No. 653,020
Claims priority, application Germany, Jan. 30, 1975, 2503783
Int. Cl.² C03C 3/08, 3/10; E05C 7/06; H01H 1/66
U.S. Cl. 335—153 15 Claims

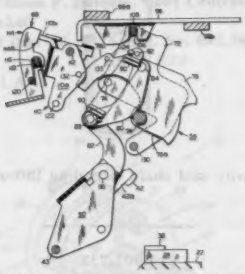
1. A glass having a thermal expansion coefficient (α) of 80.1 to 110.2 × 10^{-7}/° C. (20° –300° C), a transformation temperature (Tg) of between 428 and 488° C., a density (D) of 2.70 to 2.84 g/cc, a softening temperature (E_W) between 596° and 634° C. and a working temperature (V_4) between 792° and 863° C., said glass being produced from a melt having a composition expressed in percentages by weight as follows:

SiO_2	50.9	to	60.4,
B_2O_3	1.5	to	11.5,
Al_2O_3	2.5	to	5.3,
Li_2O	0.75	to	3.0,
Na_2O	6.0	to	15.0,
K_2O	0	to	3.8,
$Li_2O + Na_2O$	8.0	to	17.3,
$Li_2O + Na_2O + K_2O$	11.0	to	19.7,
CaO	0	to	1.5,
BaO	0	to	12.9,
ZnO	0	to	7.3,
PbO	0	to	17.5,
BaO + PbO	7.0	to	17.8,
Fe_3O_4	3.3	to	5.0,
F_2	0	to	0.7,
Sb_2O_3	0.05	to	0.1,
Sugar	0.05	to	0.1.

4,001,742
CIRCUIT BREAKER HAVING IMPROVED OPERATING MECHANISM

Charles L. Jencks, Avon, and Roger N. Castonguay, Bristol, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,149
Int. Cl.² H01H 9/20, 3/46
U.S. Cl. 335—173 10 Claims



1. A multi-pole circuit breaker comprising, in combination:
A. a support;
B. a plurality of stationary contacts mounted by said support;
C. a plurality of movable contact arms pivotally mounted by said support,
1. each said arm carrying a movable contact, and
2. said arms ganged together for conjunctive pivotal movement between a common open circuit position and a common closed circuit position with said movable contacts electrically engaging corresponding stationary contacts;
D. a frame mounted by said support;
E. a cradle pivotally mounted by said frame for movement between reset and released positions;
F. a toggle linkage interconnecting said cradle and contact arms,
1. said toggle linkage including first and second links pivotally interconnected by a knee joint, and
2. said toggle linkage maintaining said contact arms in their open circuit position while collapsed and pivoting said contact arms to their closed circuit position when straightened;
G. a latching mechanism for latchably engaging said cradle as it is pivoted to its reset position;
H. an operating lever pivotally mounted by said frame, said lever drivingly engaging said cradle upon pivotal movement in a forward direction to pivot said cradle to its reset position;
I. a spring connected between said operating lever and said knee joint, said spring being progressively rotated as said lever is pivoted in its forward direction;
J. a reciprocating slide mounted by said frame, said slide coupled to pivot said lever in its forward direction and said cradle to its reset position during a forward slide stroke and to pivot said lever in a return direction enabling said spring to straighten said toggle linkage during a return slide stroke;
K. a rotary handle mounted by said support and drivingly connected to said slide, said handle driving said slide through its forward stroke during a forward handle crank and driving said slide through its return stroke during a return handle crank.

4,001,743

HEAVY DUTY AUTOMATIC CIRCUIT BREAKER

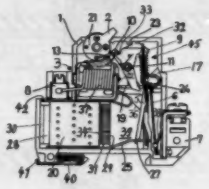
Hans Arnhold, Kaelberau, Germany, assignor to Firma Heinrich Kopp, Inhaber Theodor Simonett, Kahl (Main), Germany

Filed May 8, 1975, Ser. No. 575,642

Claims priority, application Germany, May 14, 1974, 2423207; Feb. 6, 1975, 2504954

Int. Cl.² H01H 9/30

U.S. Cl. 335—201 15 Claims



1. A heavy duty automatic circuit breaker comprising a housing of insulating material and electrical connector terminals supported in said housing, actuating means operably supported in said housing for manually operating said circuit breaker, a cocking and release mechanism arranged in said housing, contact means including a stationary contact member and a movable contact member arranged in said housing to form a circuit breaker path between said electrical connector terminals, arc quenching means arranged adjacent to said circuit breaker path in said housing, response means operatively arranged in said housing for cooperation with said actuating means, with said cocking and release mechanism and with said contact means, said movable contact member (5) comprising a single arm pivot contact, said stationary contact member (4) having a rear portion forming a first arc guide plate as part of said arc quenching means, a second arc guide plate also forming part of said arc quenching means, said second arc guide plate having an extension, pivot means on said extension of said second arc guide plate for supporting said single arm pivot contact at one end thereof, said single arm pivot contact having a free end opposite said one end, said free end being located substantially opposite said stationary contact member, and electrical connection means as part of said movable contact member, said electrical connection means being located substantially opposite said stationary contact member.

4,001,744

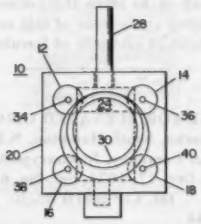
ELECTRICAL SWITCH

Richard A. Conrad, San Marcos, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed July 7, 1975, Ser. No. 593,739

Int. Cl.² H01H 9/02

U.S. Cl. 335—205 7 Claims



1. An electrical switch comprising: in combination:

at least one pair of electrical contact elements;

a first pair of magnetic pole pieces having a first air gap therebetween;

a second pair of magnetic pole pieces having a second air gap therebetween

controllable means for establishing a magnetic field in a selected one of the first and second air gaps, the controllable means including:

a magnetic member;

support means for supporting the magnetic member in a first position between the first pair of pole pieces and a second position between the second pair of pole pieces;

means for supporting the first and second pair of magnetic pole pieces relative to the magnetic member such that when the magnetic member is in its first position, a magnetic field is established in one of the first and second air gaps and when the magnetic member is in its second position, a magnetic field is established in the other of the first and second air gaps; and

means for selectively moving the magnetic member between its first and second positions; an armature;

armature support means for supporting the armature such that it can move between a first position in contact with both of the first pair of pole pieces and a second position in contact with both of the second pair of pole pieces, whereby when the controllable means establishes a magnetic field in the first air gap, the armature is attracted to its first position, and when the controllable means establishes a magnetic field in the second air gap, the armature is attracted to its second position; and

circuit means responsive to the position of the armature for opening and closing an electrical circuit between the pair of electrical contact elements.

4,001,745

INTRUSION DETECTION TRANSDUCER

Roger John Goodman, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 5, 1975, Ser. No. 584,245

Int. Cl.² H01F 21/06, 27/28

U.S. Cl. 336—20 16 Claims

1. A transducer, comprising:

a central core extending along an axis and having a length along said axis defined as xl, where x is at least two and l is a given length; and

a plurality of n wires, where n is an even integer of four or more, each of said wires being wound around different portions of said core to form x number of coils of a length of l/n and a distance l apart, center to center.

4,001,746

DIRECT-COOLED TAPE LAYER WINDING

Ove Tjernstrom, and Uno Zetterlund, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 27, 1975, Ser. No. 562,484

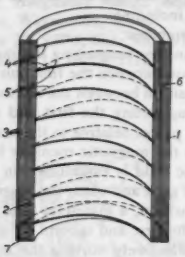
Claims priority, application Sweden, Apr. 24, 1974, 7405476

Int. Cl.² H01F 27/08

U.S. Cl. 336—62 1 Claim

1. Direct-cooled tape layer winding for transformers, comprising a plurality of helically wound tape layers and at least one cooling layer (6) coaxial with the winding and arranged between two of the tape layers, said cooling layer having substantially the same total axial length as the winding, the cooling layer (6) being formed of a plurality of cooling tubes connected in a parallel bundle helically wound into a com-

plete layer with the inlet and outlet of the cooling layer at the ends of the winding, the width of the tape being an integral



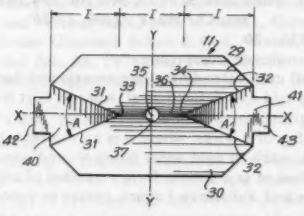
multiple of the height of a plurality of cooling tubes of the cooling conductor.

4,001,747

FLASHER SWITCH VANE STRUCTURE

Ricardo Limeres, Staten Island, and Alfred Osborn, Lindenhurst, both of N.Y., assignors to Ideal Corporation, Brooklyn, N.Y.

Filed June 23, 1975, Ser. No. 589,708
Int. Cl.² H01H *61/00, 71/18*
U.S. Cl. 337—136 **6 Claims**



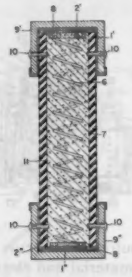
1. A switch subassembly comprising a piece of resilient sheet metal deformed from a flat horizontal reference plane into a vane intrinsically biased to a predetermined natural posture, said vane having formed therein pairs of divergent creases which extend oppositely respectively from points spaced apart on the longitudinal axis of the vane to opposite lateral edges thereof and define between the creases of each pair an end panel normally sloped away from said plane at an acute angle thereto; said vane having between said pairs of creases wing panels which slope oppositely away from said plane at the opposite sides of said axis, and having between the said points an elastically transversely bowed central portion; a thermally expansible pull member extending centrally along said vane and having its ends fixed to opposite end portions of said end panels; said pull member being so tensioned that it normally holds said vane elastically buckled into an unnatural posture in which said central portion is spaced away from said pull member, said pull member being sufficiently expansible that when heated to relax its tension said vane will be snapped toward its natural posture by its intrinsic bias, thereby bringing said pull member into face-to-face contact with said central portion.

4,001,748

ELECTRIC FUSE HAVING HELICALLY WOUND FUSIBLE ELEMENT AND PROCESS FOR MANUFACTURING THE FUSE

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed July 10, 1975, Ser. No. 594,863
Int. Cl.² H01H *85/04*
U.S. Cl. 337—159 **5 Claims**



1. An electric fuse for elevated circuit voltages including
a. a tubular casing of electric insulating material;
b. a pair of ferrules each mounted on the outside of one of the ends of said casing for precluding the escape of arc products from said casing;
c. a pulverulent arc-quenching filler inside said casing;
d. a substantially helically wound fusible element inside said casing embedded in said filler and supported substantially by said filler only in absence of any fusible element-supporting mandrel means;
e. a pair of spiders of sheet metal each arranged in abutting relation to one of the pair of rims formed by the ends of said casing, each of said pair of spiders having tabs arranged between the outer surface of said casing and the inner surface of one of said pair of ferrules and conductively connected to one of said pair of ferrules, one of said pair of spiders having a plurality of relatively small bores arranged relatively remote from the center regions thereof and one of said pair of spiders having a relatively large aperture at the center region thereof;
f. a pair of washer-like metal disks conductively interconnected by said fusible element and each affixed to the axially inner surface of said center region of one of said pair of spiders, each of said pair of disks having a plurality of relatively small bores arranged relatively remote from the center region thereof in registry with said relatively small bores in said one of said pair of spiders and one of said pair of disks having a relatively large aperture at the center region thereof in registry with said relatively large aperture in one of said pair of spiders; and
g. the fit of each of said pair of disks inside said casing being so loose and the thickness of each of said pair of disks being so small as to allow the pressure of products of arcing prevailing at the ends of said casing to act against the end surfaces of said pair of ferrules.

4,001,749

ELECTRIC FUSE FOR ELEVATED CIRCUIT VOLTAGES

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

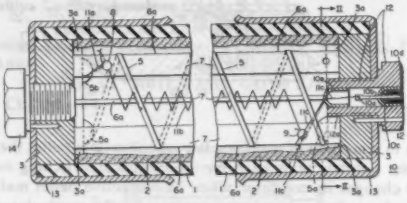
Filed Dec. 17, 1975, Ser. No. 641,665
Int. Cl.² H01H *85/30*
U.S. Cl. 337—244 **5 Claims**

1. An electric fuse for elevated circuit voltages including
a. tubular casing of electric insulating material housing therein a granular arc-quenching filler;
b. a pair terminal elements closing the ends of said casing;
c. a spring-biased blown fuse responsive device arranged

immediately adjacent one of said pair of terminal elements;

d. first substantially helically wound low resistance fusible element means submersed in said filler conductively interconnecting said pair of terminal elements;

e. a second high resistance fusible element means submersed in said filler shunting at least a portion of said first fusible element means and arranged to control the operation of said blown fuse responsive device, said second fusible element means having a pair of spaced sections



forming therebetween a voltage responsive breakdown spark gap;

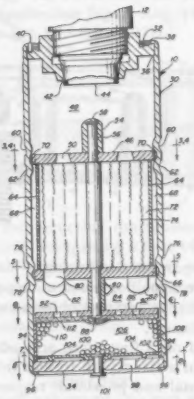
f. a mandrel of electric insulating material having edges extending in a direction longitudinally of said casing and supporting said first fusible element means, said mandrel having a perforation, and each of said pair of spaced sections of said second fusible element means being threaded through said perforation in said mandrel at spaced points of said perforation so that said perforation in said mandrel forms said spark gap.

4,001,750

CORROSION RESISTANT MEANS IN EXHAUST CONTROL DEVICE FOR CIRCUIT INTERRUPTING DEVICES

Henry W. Scherer, Chicago, Mount Prospect, and Roy T. Swanson, North Riverside, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Sept. 2, 1975, Ser. No. 609,599
Int. Cl.² H01H *85/38*
U.S. Cl. 337—280 **27 Claims**



1. An exhaust control device for a circuit interrupter comprising:

a hollow housing having a corrosion resistant coating thereon;

an inlet end wall having an intake port formed therein for receiving a stream of hot exhaust gases incident to the operation of the circuit interrupter, said inlet end wall held in place within one end of said hollow housing by folding said hollow housing over said inlet end wall so that the corrosion resistant coating on said housing is not damaged;

at least one baffle for partitioning said hollow housing into a plurality of chamber for cooling and filtering the hot exhaust gases, for changing the flow of the hot exhaust gases, and for attenuating sound, said at least one baffle held in place within said hollow housing by the crimping of said hollow housing adjacent to said at least one baffle so that the corrosion resistant coating is not damaged;

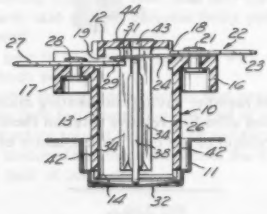
an outlet end wall having a corrosion resistant coating thereon, and having one or more exit ports formed therein, for allowing the exhaust gases to escape to the atmosphere, said outlet end wall held in place within the other end of said hollow housing by folding said hollow housing over said outlet end wall so that the corrosion resistant coating on said housing is not damaged.

4,001,751

NON-RESETTABLE THERMOSTAT

Bernard S. Deubel, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed Oct. 22, 1975, Ser. No. 624,968
Int. Cl.² H01H *37/74*
U.S. Cl. 337—343 **9 Claims**



1. A bimetal snap disc thermal device comprising a one-piece molded cup shaped body providing an elongated switch cavity of substantially uniform cross section defined by an end wall and a side wall which extends to an open end, a pair of support projections extending outwardly in opposite directions from said side wall for supporting a switch, an opening in said side wall adjacent to each projection, a switch including contact and terminal means riveted to each projection and extending laterally through the associated opening into said cavity, a disc cup mounted on said body at said open end, a bimetal snap disc positioned by said disc cup at said open end, and a bumper in said body operating said switch in response to snap movement of said disc, said body providing opposed and laterally spaced guide channels in said side wall having a length at least substantially equal to the spacing therebetween, said bumper being generally rectangular and providing opposed sides positioned in said guide channels to guide and position said bumper.

4,001,752

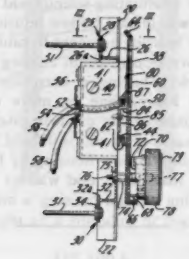
CALIBRATING ADJUSTMENT OF THERMOSTAT

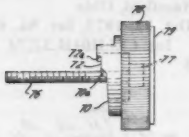
Herbert T. Hazleton, Brandon, Manitoba, Canada, assignor to Federal Pioneer Electric Limited, Toronto, Canada

Filed July 11, 1975, Ser. No. 595,220
Claims priority, application Canada, Nov. 18, 1974, 213923
Int. Cl.² H01H *37/20*
U.S. Cl. 337—368 **9 Claims**

1. A thermostat having a main support, an ambient temperature sensor, a switch controlled by the ambient temperature sensor, said switch and ambient temperature sensor being carried by the main support, and cam means for establishing the set-point of the thermostat and including a cam follower coupled to the sensor and a cam member having a lateral cam surface for determining the position of the cam follower to

adjust the set-point of the thermostat, and a support member rotatable about an axis and supported upright from the base plate and restrained from axial movement, said cam member





and said support member having cooperating male and female threaded portions affording relative rotation therebetween for causing displacement of the cam upon rotation of the support member.

4,001,753

THERMOSTAT HAVING STABLE MOUNTING SUPPORT

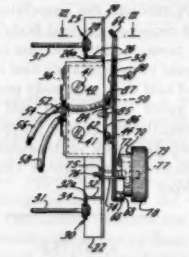
Herbert T. Hazleton, Brandon, Canada, assignor to Federal Pioneer Electric Limited, Toronto, Canada

Filed July 11, 1975, Ser. No. 595,222

Claims priority, application Canada, Dec. 17, 1974, 216159

Int. Cl.² H01H *37/04*

U.S. Cl. 337—380 **10 Claims**



1. A thermostat having a base plate including as integral portions thereof a support area, stiffening parts, a pair of mounting strips and pairs of stress-isolating junctions, an ambient temperature sensor, and a switch controlled by the ambient temperature sensor, said switch and ambient temperature sensor being carried by said support area of the base plate in calibrated relationship to each other, said stiffening parts extending upright from the support area of the base plate, said pairs of mounting strips extending parallel to and offset from the support area of the base plate, and a respective one of said pairs of stress-isolating junctions connecting the respective mounting strips proximate the ends thereof to different ones of the stiffening parts of the base plate.

4,001,754

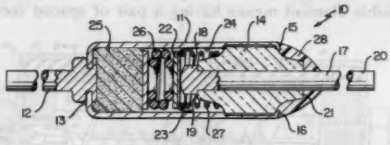
TEMPERATURE RESPONSIVE ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Emil Robert Plasko, Washington Township, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 21, 1974, Ser. No. 471,851

Int. Cl.² H01H *37/36*

U.S. Cl. 337—407 **9 Claims**



1. In a method of making a line of collapsible pellet thermal limiter constructions each having electrical switching means that changes its condition when its respective pellet melts by being heated to a certain temperature for the particular pellet and having an epoxy material sealing one end of a casing of said construction, said line of thermal limiter constructions including constructions that will have their respective pellets melt at temperatures at or below approximately 200° F and at or above approximately 370° F, the improvement comprising the step of disposing filler material in said epoxy material of each thermal limiter construction being made in said line only in the order of approximately 4% to approximately 6% by weight of said epoxy material whereby said filler material improves the effective seal life of said epoxy material of each thermal limiter construction being made in said line thereof.

4,001,755

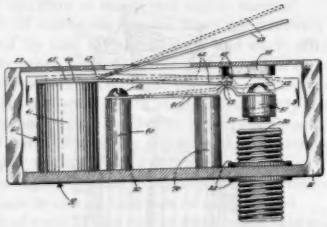
ACTUATOR APPARATUS

Oscar B. Noren, Grosse Pointe Farms, and Edmund J. Kwarsick, Detroit, both of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Dec. 19, 1975, Ser. No. 642,440

Int. Cl.² H01L *43/00, 43/02*

U.S. Cl. 338—32 H **6 Claims**



1. Actuator apparatus comprising

a field-sensitive signalling element responsive to local magnetic field change and producing an electrical signal with each such change,

a body carried on a first pivot arm adapted for repetitive movement in a fixed path to and from first and second positions distal and proximal, respectively, to the field-sensitive element, said pivot arm in the absence of an activating force being biased by spring means to the first position, at least one of said field-sensitive element and body having magnetic field properties such that each cycle of the reciprocal movement of the body can be sensed by the field-sensitive element, thereby producing a single signal per cycle,

a second pivot arm carried on a resilient support and having a free end adapted to be moved under an actuating force in a fixed path in engagement with said first pivot arm to

cause the body to move from the first position to the second position, and

lever means for applying actuating force to the second pivot arm to cause the body to move from the first position to the second.

4,001,756

MEASURING CELL FOR DETERMINING OXYGEN CONCENTRATIONS IN A GAS MIXTURE

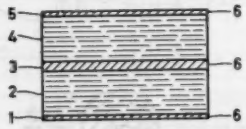
Leopold Heijne, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 23, 1975, Ser. No. 598,179

Claims priority, application Netherlands, Aug. 19, 1974, 7411044

Int. Cl.² H01L *31/00;* **G01N** *31/00*

U.S. Cl. 338—34 **3 Claims**



1. Measuring cell for determining oxygen concentrations in a gas mixture on the basis of a semiconductive oxide the electric resistance of which depends on the partial oxygen pressure, said cell comprising two measuring elements each comprising a semiconductive oxide, one element being doped to have n-type conductivity and the other being doped to have p-type conductivity, each of said elements having a high diffusion co-efficient for oxygen and having substantially equal activating energies, said elements being separated by a metal layer.

4,001,757

METHOD FOR DETECTING A REDUCING MATERIAL IN A GAS PHASE

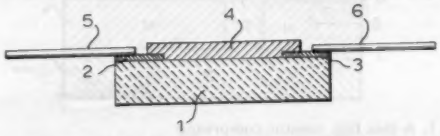
Tomi Sato, Neyagawa, and Yoshio Iida, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 12, 1974, Ser. No. 496,860

Claims priority, application Japan, Aug. 14, 1973, 48-91493

Int. Cl.² G01N *27/12*

U.S. Cl. 338—34 **6 Claims**



1. A gas sensor for detecting the presence of a reducing material in a gas phase, comprising a base of electrically insulating material, a pair of spaced electrodes on said base, and a body of solidified product comprised of partially dehydrated ferrous hydroxide on said base and bridging said electrodes and in electrical contact therewith.

4,001,758

STOICHIOMETRIC AIR/FUEL RATIO EXHAUST GAS SENSOR

Michael J. Esper, Redford Township; Wells L. Green; Stanley R. Merchant, both of Garden City, and Charles M. Wells, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 2, 1975, Ser. No. 609,767

Int. Cl.² H01L *7/00*

U.S. Cl. 338—34 **7 Claims**

1. A partial pressure of oxygen sensor for insertion into the exhaust system of an internal combustion engine comprising in combination:

a mounting body formed of durable metallic material threaded on one end for securement to the exhaust system and having a bore extending therethrough;

a first ceramic body received within said mounting body bore and extending therethrough having a slotted tip, an oppositely positioned rear face, and a pair of passages extending away from said slotted tip to said rear face;

a wafer of partial pressure of oxygen responsive ceramic material received within said slotted tip and having a first pair of conductors attached thereto in spaced-apart relationship;

said conductors extending through said first ceramic body passages away from said slotted tip to a point proximate to said rear face;

a second ceramic body having a pair of passages extending therethrough arranged in abutting relationship with said first ceramic body rear face, said first ceramic body passages and said second ceramic body passages being in alignment;

a second pair of conductors received with said second ceramic body passages;

heat flowable material deposited in said passages proximate said rear face for connecting one end of said second pair of conductors to said first pair of conductors; and

electrical terminal means connected to the other end of said second pair of conductors.

4,001,759

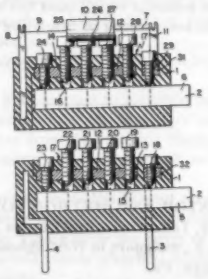
VARIABLE ELECTRIC RESISTOR DEVICE

David E. Bailey, Belleville, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 22, 1975, Ser. No. 643,244

Int. Cl.² H01C *13/00*

U.S. Cl. 338—68 **3 Claims**



1. A variable electric resistor device, comprising

a block of electrical insulating material;

a substantially elongated member of current resistive metal removably positioned in the insulating material;

a pair of electrically conductive termial leads each electrically connected to a corresponding end of the current resistive member;

a substantially elongated ancillary member of electrically conductive material embedded in the insulating material in spaced substantially parallel relation with the current resistive member;

a plurality of spaced transverse internally threaded bores formed through the ancillary member;

a plurality of spaced bores formed through the block extending from both sides of the internally threaded bores from the current resistive member to a surface of the block; and

a plurality of electrically conductive screws each threadedly coupled in a corresponding one of the threaded bores and extending in the corresponding bore thereof in a manner whereby selected screws are movable into electrical contact with the current resistive member.

4,001,760

HEATING CABLES AND MANUFACTURE THEREOF

David Malcolm Howie, Carrying Place; Roy Victor W. McKenzie, Belleville, and James Ronald Snape, Brighton, all of Canada, assignors to Pyrotenax of Canada Limited, Trenton, Canada

Filed June 16, 1975, Ser. No. 587,161

Claims priority, application United Kingdom, June 21, 1974, 27623/74

Int. Cl.² H01C 1/03

U.S. Cl. 338—238 **6 Claims**

1. A mineral insulated heating cable, having the characteristic that for a given supply voltage the heat generated per unit length of the cable is substantially unaffected by the total length of the cable, comprising at least two metallic conductors, a metallic protective sheath, a body of compacted mineral insulating material filling said sheath and spacing the said conductors from one another and embedded in the compacted mineral insulating material and contacting each of the two said conductors throughout their lengths, at least one resistance element in the form of a thin layer consisting predominantly of resistive material which does not include an admixture of any significant amount of insulating material.

4,001,761

HELICAL RESISTOR AND METHOD FOR ASSEMBLING

Marvin E. Liebler, Tonawanda, and Eugene J. Lum, Williamsville, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1975, Ser. No. 591,246

Int. Cl.² H01C 3/00

U.S. Cl. 338—304 **6 Claims**

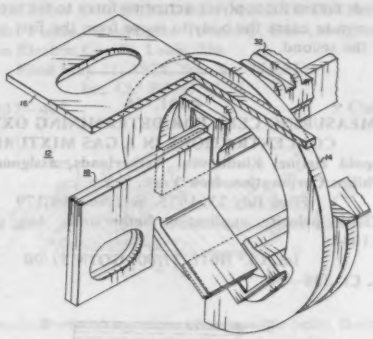
1. A resistor, comprising:

a helical resistance element; and

an internal support structure axially disposed within said helical resistance element, said support structure comprising:

a plurality of insulating assemblies, each of said assemblies comprising a support member, insulating means, and spring means cooperating with said support member and said insulating means to position said insulating means upon said support member, and

spreader means interiorly disposed within said resistance element and having a plurality of radially extending members attached to said support members and rigidly seating



said insulating means against the interior of said resistance element.

4,001,762

THIN FILM RESISTOR

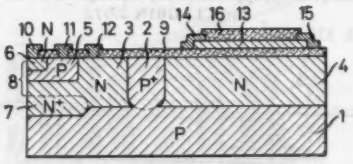
Teruaki Aoki, Tokyo; Hisayoshi Yamoto; Masanori Okayama, both of Hatano; Yoshimi Hirata, Atsugi; Shuichi Sato, Chofu, and Takaaki Yamada, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 2, 1975, Ser. No. 582,618

Claims priority, application Japan, June 18, 1974, 49-69576

Int. Cl.² H01C 1/012

U.S. Cl. 338—309 **11 Claims**



1. A thin film resistor comprising:

a supporting member,

a polycrystalline silicon film containing oxygen in the range between 2 to 45 atomic percent formed on said supporting member, and

electrical contacts formed on spaced portions of said polycrystalline silicon film.

4,001,763

ELECTRONICALLY STABILIZED BEAM FORMER SYSTEM

Arent H. Kits van Heyningen, Newport, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 3, 1975, Ser. No. 546,373

Int. Cl.² G01S 9/66, 7/54

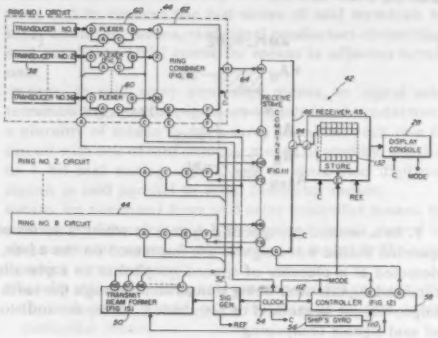
U.S. Cl. 340—3 PS **16 Claims**

5. In combination:

a plurality of radiating elements arranged in an array having symmetry about a central axis for providing beams of

radiation oriented relative to said array by angles of tilt and bearing;

a plurality of storage units coupled to said plurality of radiating elements for providing a set of delays to signals coupled to said radiating elements for providing a beam of radiation having a predetermined angle of tilt, said



storage units being addressable for providing other sets of signal delays corresponding to other angles of tilt; and

means coupled to said storage units for permuting a sequence of addresses to said storage units for altering the orientation of a beam of radiation at a rate higher than the bandwidth of said signals.

4,001,764

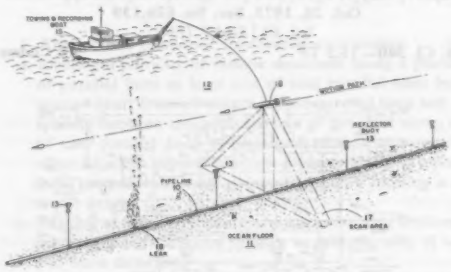
ACOUSTIC METHOD FOR DETECTING LEAKS FROM SUBMERGED PIPELINES

Warren E. Holland, and George R. Burrell, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 479,398, June 14, 1974, abandoned. This application June 17, 1975, Ser. No. 587,784

Int. Cl.² G01S 9/66

U.S. Cl. 340—3 R **29 Claims**



1. A method for detecting leaks of liquid being conducted through a submerged pipeline from said pipeline comprising the steps of:

directing acoustic waves along the path of said pipeline;

introducing fluid into said liquid-carrying pipeline;

recording the reflected acoustic waves; and

determining from said recorded waves the location of leaks of said liquid from said pipeline.

4,001,765

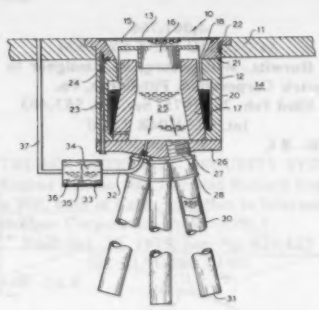
PRESSURE COMPENSATING SOUND TRANSDUCER APPARATUS

Claude C. Sims, Orlando, Fla., assignor to Marine Resources, Inc., Fern Park, Fla.

Filed Mar. 31, 1975, Ser. No. 563,845

Int. Cl.² H04B 13/00

U.S. Cl. 340—8 PC **10 Claims**



1. A low frequency pressure compensating sound transducer comprising in combination:

transducer casing adapted to be attached through a surface;

sealing diaphragm mounted to said casing for sealing an opening in said casing;

movable piston movably mounted in said casing;

piston driving means for moving said piston when actuated;

a liquid filled chamber formed by said casing and said piston driving means:

tubular liquid filled impedance matching means for matching the pressure on each side of said sealing diaphragm, said impedance matching means being openly coupled to said liquid filled chamber and said impedance matching means having flexible walls of predetermined area and compliance to provide pressure release to one side of said movable piston, whereby a pressure release for a low frequency underwater sound transducer operates without gas compensation; and

a tube coupled between open sea water and said liquid filled chamber whereby a low frequency pressure transducer can be of small size.

8. A pressure compensating sound transducer comprising in combination:

an underwater hull adapted to maintain substantially atmospheric pressure on the inside thereof and to withstand a higher pressure from the exterior thereof;

a transducer casing mounted through an opening in said hull;

a sealing diaphragm mounted to said transducer casing to seal the opening in said hull for isolating the interior of the transducer casing from the entry of sea water;

a movably mounted piston attached to the interior of said transducer casing;

piston driving means operatively connected to said piston for moving said piston when actuated to produce electrical signals;

a liquid-filled chamber formed in said casing behind said piston driving means;

an impedance matching means having at least one hollow, elongated cylinder operatively coupled to said liquid-filled chamber and being filled with liquid, each said elongated cylinder extending into the interior atmospheric pressure of said hull and having stiff, flexible walls of predetermined area and compliance so as to flex upon an increase of the liquid pressure therein responsive to vibrations of said movable piston to provide a pressure release to one side of said movable piston whereby a

pressure release for low frequency underwater sound transducers operates without gas compensation; and

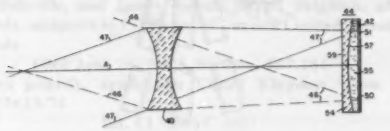
coupling means connecting said liquid filled chamber inside said hull to the exterior of said hull, said coupling having a flexible membrane therein for isolating the liquid of said chamber from the sea water exterior of said hull for varying the pressure in said liquid filled chamber relative to the pressure surrounding said hull.

4,001,766

ACOUSTIC LENS SYSTEM

Michael J. Hurwitz, Wilkinsburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1975, Ser. No. 553,403
Int. Cl.² H04B *13/00*
U.S. Cl. 340—8 L **7 Claims**



1. Acoustic lens apparatus comprising:

A. an acoustic lens normally operative to focus acoustic energy from points on an object surface onto a focal surface;

B. transducer means defining elemental transducers of an array;

C. a focal surface modifier including at least two adjacent elements having different indices of refraction disposed proximate said transducer array in the path of acoustic energy passing through said lens and operable to modify said focal surface to conform to a predetermined other surface shape;

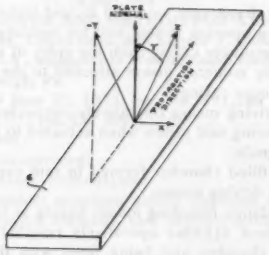
D. said transducer array being positioned at said modified focal surface and having a shape to generally conform to said predetermined other surface shape.

4,001,767

LOW DIFFRACTION LOSS-LOW SPURIOUS RESPONSE $LiTaO_3$ SUBSTRATE FOR SURFACE ACOUSTIC WAVE DEVICES

Andrew J. Slobodnik, Jr., Malden, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1975, Ser. No. 633,070
Int. Cl.² H01L *41/08*
U.S. Cl. 310—9.5 **1 Claim**



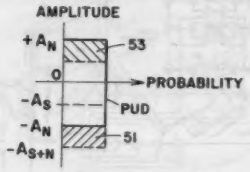
1. A surface acoustic wave device substrate member of single crystal lithium tantalate having an acoustic surface wave propagation surface defined by a plane that substantially coincides with the Euler angles Lambda = 0°, Gamma = 166.65(+0, −0.3)° and Theta = 90°.

4,001,768

DATA ACQUISITION, TRANSPORT AND STORAGE SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena, and C. Hewitt Dix, Pasadena, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.

Filed May 7, 1973, Ser. No. 358,077
Int. Cl.² G01V *1/24*, *1/22*
U.S. Cl. 340—15.5 FC **18 Claims**



1. In a seismic prospecting system in which a series of sequential elastic wave signals are impressed on the earth, and detected at a plurality of spaced geophones as a plurality of received signals after being transmitted through the earth, the improvement in method of acquisition, transport and storage of said signals comprising:

a. amplifying each of the received signals to obtain a plurality of M amplified analog signals;

b. generating a plurality of M shifting functions having selected amplitudes;

c. adding each of said shifting functions to a different one of said amplified analog signals to obtain a plurality of M analog signals;

d. at first selected intervals of time converting each of said analog signals to axis-crossing-coded signals;

e. sampling at digitizing intervals said axis-crossing coded signals to form one bit digitized pulses and storing said pulses in parallel, in a parallel-to-serial converter means;

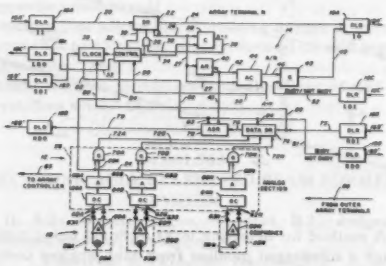
f. at second selected intervals of time, reading out in series, said stored pulses and transmitting them in series to a storage means as a train of binary bits.

4,001,769

DATA ARRAY NETWORK SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena, and Donald R. Juliffs, Chatsworth, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 563,184, March 28, 1975, Pat. No. 3,938,073, which is a continuation of Ser. No. 358,097, May 7, 1973, Pat. No. 3,881,166. This application Oct. 28, 1975, Ser. No. 626,139
Int. Cl.² G01V *1/34*
U.S. Cl. 340—15.5 TS **18 Claims**



1. A data gathering system comprising:

a. a plurality of array terminals, each having a parallel to serial convertor means;

b. each array terminal having a plurality of conductor means, each connected to at least one detector so that

said detectors can be positioned in selected spaced relation, to sense at least one physical parameter, and to produce an analog signal indicative of said parameter;

c. each array terminal having an input port and an output port, into each of which a multiple conductor cable is connected, said multiple conductors comprising signal and control conductors;

d. means, including a plurality of selected lengths of said cable, to connect said array terminals in series connection, and to connect the last series of said terminals to array controller means, said signal conductors connecting said parallel to serial convertor means in adjacent terminals;

e. means, in said array controller means, to signal said terminals, by a coded signal on said control conductors;

f. a plurality of means in each array terminal, each one in circuit with one of said detector means to amplify, digitize to 1 bit said analog signal, and to store said digitized signals in said parallel to serial convertor means;

g. means, on command from said array controller means, to read out and transmit said 1 bit digitized signals, stored in said convertor means, to the convertor means in the next in series array terminal,

whereby said digitized signals are transmitted sequentially through each of said convertor means to said array controller means.

4,001,770

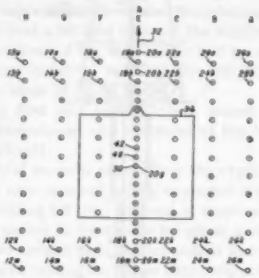
ROLL-A-LONG THREE-DIMENSIONAL COMMON DEPTH POINT EXPLORATION

Helmut H. Hofer, Calgary, Canada, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 17, 1974, Ser. No. 479,929

Int. Cl.² G01V *1/20*

U.S. Cl. 340—15.5 MC **20 Claims**



1. The method of seismic exploration comprising:

a. locating a plurality of seismic detectors along a plurality of parallel lines at least one of said parallel lines being spaced apart from all others of said parallel lines and the spacing between any adjacent pair of detecors along one of said parallel lines being equal to that between any other adjacent pair of detectors along one of said parallel lines, said seismic wave detectors thereby forming a detector array.

b. locating at least two seismic wave transmitting stations at predetermined locations relative to said plurality of seismic wave detectors,

c. initiating seismic waves from said at least two seismic wave transmitting stations said seismic waves being received by said detectors,

d. defining a distance D and a number M where D is a submultiple of the spacing between any adjacent pair of detectors along one of said parallel lines and M is the ratio of said spacing to the distance D,

e. repeatedly moving said at least two seismic wave transmitting stations a distance D in a direction parallel to any of said plurality of parallel lines and at each M^{th} such move, moving said detector array by a distance equal to the spacing between adjacent pairs of detectors and in a direction parallel to any of said plurality of parallel lines,

f. after each movement thereof initiating additional seismic waves from said at least two seismic wave transmitting stations, and

g. repeating steps (e) and (f) until a desired length of seismic traverse has been covered to provide three-dimensional common depth point coverage along said seismic traverse.

4,001,771

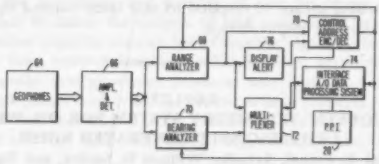
INTRUDER DETECTING SECURITY SYSTEM

Herman Eugene Amrine, San Jose, and Richard Eugene Baker, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,153

Int. Cl.² G08B *13/00*

U.S. Cl. 340—16 R **20 Claims**



1. An intruder detecting security system for determining an intrusion across a boundary, comprising

a plurality of pairs of sensors responsive to waves propagated through geological and like substantially rigid materials with each pair having the sensors arranged operationally orthogonally of each other, and the pairs arranged substantially in line along said boundary,

analyzing circuitry connected to said sensors for determining the difference in the time for longitudinal and transverse waves set up by a single disturbance to travel from the disturbance to said sensors and

computing circuitry connected to said analyzing circuitry for resolving location of said disturbance.

4,001,772

CODED SIGNALING AND CONTROL SYSTEM

Truman W. Powell, Zephyrhills, Fla., and Jordan R. Davis, Lula, Ga., assignors to Truman W. Powell, Zephyrhills, Fla.

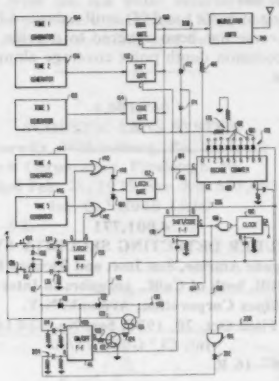
Filed July 30, 1975, Ser. No. 600,408

Int. Cl.² H04Q *9/12*

U.S. Cl. 340—171 PF **8 Claims**

1. A selective signaling and control system comprising a transmitting circuit including a first network for generating a start and reset signal at a first frequency, a second network for generating a shift and code word comprising a plurality of alternate second and third frequency tones representing shift and code bit signals, respectively, and a third network for generating a latch control signal at a frequency differing from said first, second and third frequencies; and a receiving circuit including first means responsive to said start and reset signal for assuming a data receive mode, second means responsive to said alternate shift and data bit signals to store said data bit signals to sequence, means comparing said stored data bit

signals with a preselected code and generating an output when the two are equal, and a network enabled by the output of the



comprising means to respond to said latch control signal for activating an output device.

4,001,773

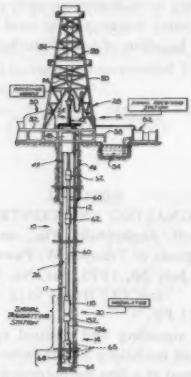
ACOUSTIC TELEMETRY SYSTEM FOR OIL WELLS UTILIZING SELF GENERATED NOISE

Arthur E. Lamel, Arcadia; William D. Squire, and Harper J. Whitehouse, both of San Diego, all of Calif., assignors to American Petroscience Corporation, Bakersfield, Calif.

Continuation-in-part of Ser. No. 396,403, Sept. 12, 1973, Pat. No. 3,906,434, which is a division of Ser. No. 113,147, Feb. 8, 1971, Pat. No. 3,790,930. This application July 28, 1975, Ser. No. 599,836

Int. Cl.² G01V *1/02, 1/40*

U.S. Cl. 340—18 LD 20 Claims



1. In a wall drilling system, a method of communicating information between signal-transmitting and signal-receiving stations spaced along a drill string having an intervening length between said stations capable of sustaining acoustic waves within the substance of the string, comprising the steps of:

utilizing, for the communication of said information, acoustic waves that are already present in the drill string solely as an inherent consequence of conducting drilling operations in said system and which can propagate along said drill string, within the substance thereof, at least between said transmitting and receiving stations;

generating a modulating signal containing the information to be transmitted;

modulating said acoustic waves in said drill string at said transmitting station by said modulating signal according to a predetermined modulating mode to contain the information to be transmitted, all in such manner that resulting modulated acoustic waves then travel from said transmitting station to said receiving station through the substance of the drill string; and

receiving said modulated waves at said receiving station to recover said signal and its contained information.

4,001,774

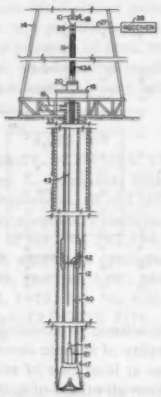
METHOD OF TRANSMITTING SIGNALS FROM A DRILL BIT TO THE SURFACE

Charles R. Dawson, and Richard J. Kostelnicek, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 8, 1975, Ser. No. 539,361

Int. Cl.² G01V *1/40, 1/22;* E21B *47/12*

U.S. Cl. 340—18 LD 20 Claims



1. In a method of drilling a well wherein an electrical signal is transmitted between a subsurface location within said well and a location substantially at the surface, the improvement comprising:

transmitting said electrical signal by means comprising a first insulated conductor, electrically connected to transmitting means at one of said locations and extending through said well a substantial distance toward the other location;

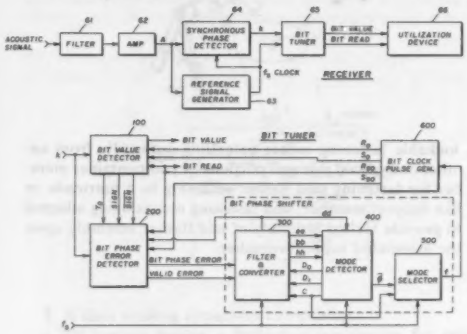
receiving said electrical signal by means comprising a second insulated conductor extending from said other location through said well a sufficient distance so as to at least partially overlap the first said conductor; and

lowering the insulated conductor which extends through said well from said subsurface location further into said well, thereby reducing the overlap between said conductors, while continuing to transmit and receive said electrical signal.

4,001,775
AUTOMATIC BIT SYNCHRONIZATION METHOD AND APPARATUS FOR A LOGGING-WHILE-DRILLING RECEIVER

James H. Sexton, Duncanville; Bobbie J. Patton, Dallas, and John W. Harrell, Duncanville, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 403,238, Oct. 3, 1973, abandoned.
This application Sept. 23, 1974, Ser. No. 508,318
Int. Cl.² G01V 1/40; H04L 7/02
U.S. Cl. 340—18 LD 14 Claims



1. In the logging of a well having a downhole acoustic transmitter for transmitting upward through a drilling liquid inside a drill string an acoustic signal modulated between at least two modulation states so as to be encoded with information relating to a measured downhole condition, each modulation state being transmitted over a predetermined number of acoustic signal cycles which define a bit time interval; and an uphole receiver for demodulating the acoustic signal to produce an output signal representative of the modulation state of the acoustic signal over a bit time interval, the method of synchronizing the operations of the transmitter and receiver in transmitting and demodulating, respectively, the acoustic signal, comprising the steps of:

a. producing first and second clock pulses defining the expected boundaries and midpoint of the bit time interval, respectively,

b. sampling said acoustic signal from the expected midpoint of one bit time interval to the expected midpoint of the next succeeding bit time interval in response to said second clock pulses to produce a bit phase error signal having a first or second polarity dependent upon said second clock pulse occurring earlier or later, respectively, in time than the true midpoint of the bit time interval,

c. detecting changes in the modulation state of the acoustic signal during the sampling period from the midpoint of one bit time interval to the midpoint of the next succeeding bit time interval, and

d. phase shifting said first and second clock pulses earlier or later in time in accordance with the polarity of said bit phase error signal so as to be synchronized with the true boundaries and midpoint of the bit time interval, said phase shifting occurring only in response to the detection in step (c) of a modulation state change in the acoustic signal during the sampling period.

10. In a system for logging while drilling including a downhole acoustic transmitter for transmitting upward through a drilling liquid inside a drill string an acoustic signal modulated between at least two phase states in response to a measured downhole condition and a lack of change in phase representing a bit of a different character, each bit representation being transmitted over a predetermined number of acoustic signal cycles which define a bit time interval; and an uphole receiver for demodulating the acoustic signal to produce a synchronously rectified signal representative of the phase state of the acoustic signal, the improvement comprising:

a. means for producing a bit value pulse of a first state when the phase of said synchronously rectified signal changes at the end of a bit time interval and of a second state when the phase of said synchronously rectified signal does not change at the end of a bit time interval, the bit value pulse thereby indicating the value of the transmitted bit over a bit time interval,

b. means for producing a train of synchronizing pulses at the frequency of the acoustic signal,

c. a counter for counting said synchronizing pulses,

d. a generator for producing first and second clock pulses when the number of synchronizing pulses counted equals the number of acoustic signal cycles in a bit time interval, said first and second clock pulses defining, respectively, the expected time occurrence of the boundaries and midpoint of the bit time interval,

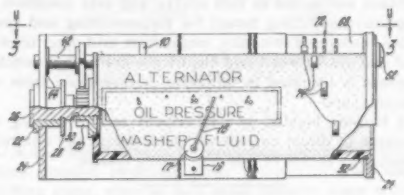
e. a first integrator responsive to said second clock pulse for integrating said synchronously rectified signal from the midpoint of one bit time interval to the midpoint of the next succeeding bit time interval, the output of said first integrator being a bit phase error signal of a first or second polarity if said second clock pulses are occurring earlier or later, respectively, in time than the true midpoint of the bit time interval, and

f. means for deleting pulses from or injecting additional pulses into said train of synchronizing pulses in response to the magnitude and polarity of said bit phase error signal to cause the output of said counter to reach a number equal to the number of acoustic signal cycles in a bit time interval later or earlier in time, respectively, whereby said generator produces said first and second clock pulses later or earlier in time so as to properly phase said first and second clock pulses with the true boundaries and true midpoint, respectively, of the bit time interval.

4,001,776
MULTIPLE INDICATION DISPLAY

John A. Carol, Jr., and Raymond J. Peterson, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1975, Ser. No. 601,596
Int. Cl.² G08B 19/00
U.S. Cl. 340—52 F 4 Claims



1. A multiple indication display to display singly any one of a number of measured conditions comprising

means to measure each of said conditions simultaneously and respectively;

elements responsive to each of said means, respectively, when a specific condition attains a predetermined value indicative of abnormality;

a meter having a plurality of indicia operative in conjuncton with said means, respectively, to indicate the value of the individual measurement made by the same, said indicia being selectively displayed in relation to the meter, said meter having a single indicator registerable with the specific one of said indicia which is displayed to indicate the value of said condition,

means responsive to an indication of abnormality by one of said elements effective to display the corresponding indicia of said meter and to energize the indicator to effect an indication of the value of the abnormal condition.

4,001,777

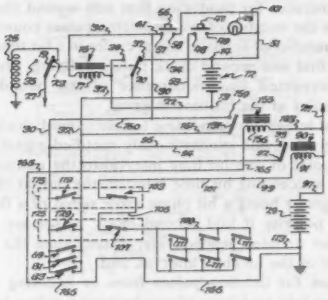
TAXIMETER PROTECTION SYSTEM

Elmore Alexander, 726 Northampton St., Buffalo, N.Y. 14211

Continuation-in-part of Ser. No. 371,970, June 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 241,992, April 7, 1972, abandoned. This application June 21, 1974, Ser. No. 481,745

Int. Cl.² B60Q 1/26

U.S. Cl. 340—68 **31 Claims**



1. A monitoring system for a vehicle for hire having a meter for registering the fare, said vehicle having an operating circuit including a storage battery, said monitoring system comprising:

a. a source of direct current having a pair of terminals;

b. electrically controlled switching means connected to one terminal of said source, said switching means normally having a first state and operative to change to a second state when an electrical circuit is completed between said source and said switching means;

c. condition responsive switching means connected to the other terminal of said source and to said electrically controlled switching means, said condition responsive switching means being operative in response to abnormal conditions of said meter, said vehicle and said monitoring system to complete an electrical circuit between said source and said electrically controlled switching means;

d. said electrically controlled switching means including means connected to said source and said condition responsive switching means for disconnecting said condition responsive switching means from said other terminal of said source when said electrically controlled switching means is operated to minimize current drain from said source; and

e. a housing located in said vehicle and containing said source of direct current and said electrically controlled switching means of said monitoring system.

4,001,778

FLASHER LAMP/PROTECTIVE CONTAINER ASSEMBLY

Edward T. Ross, 110 Day St., Newington, Conn. 06111

Filed Oct. 9, 1973, Ser. No. 404,512

Int. Cl.² E01F 9/01

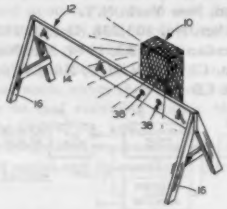
U.S. Cl. 340—114 B **8 Claims**

1. A portable flasher assembly for mounting on barricades or the like comprising:

a. a flasher unit including a housing containing a power source and a lamp unit;

b. an impact resistant protective container extending about said flasher unit and having a multiplicity of interconnected sidewall portions and an endwall portion, said container providing a chamber receiving said flasher unit and open at one end to permit insertion and withdrawal of said flasher unit without disassembly of said unit, at least some of said wall portions being light transmitting to permit said lamp unit to send light rays outwardly therefrom:

c. lockable mounting means mounting said housing of said flasher unit to one sidewall portion within said container and accessible through a sidewall portion of said container so as to permit unlocking thereof and removal of said flasher unit for servicing; and



d. lockable fastening means extending outwardly from another one of said sidewall portions of said container member for fastening said flasher assembly to a barricade or like support member, said fastening means being adapted to provide locked assembly of said flasher assembly upon the associated support member.

4,001,779

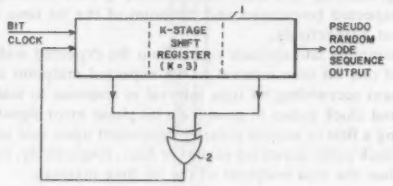
DIGITAL ERROR CORRECTING DECODER

Maurice Leon Schiff, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 12, 1975, Ser. No. 603,994

Int. Cl.² G06F 11/12

U.S. Cl. 340—146.1 AV **18 Claims**



1. A digital error correcting decoder comprising:

an input conductor for received digital data including a random sequence of (N + 1) code words having N pseudo random code words and one all logic "0" code word, each of said (N + 1) code words having N bits, where N is an integer greater than one;

first means to generate in a predetermined sequence each of said (N + 1) code words;

second means coupled to said input conductor and said first means to compare each bit of each of said received (N + 1) code words with each bit of all of said generated (N + 1) code words in said predetermined sequence;

third means coupled to said second means to detect the largest amplitude value resulting from said comparison of each bit of one of said receiver (N + 1) code words with each bit of all of said generated (N + 1) code words; and

fourth means coupled to said first means and said third means to select that one of said generated (N + 1) code words causing the detection of the largest amplitude value as an error corrected code word for said one of said received (N + 1) code words.

4,001,780
DATA READING APPARATUS

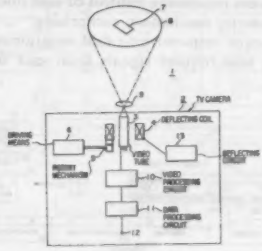
Tsuyoshi Kikukawa, and Tsutomu Hashimoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 23, 1975, Ser. No. 598,237

Claims priority, application Japan, Aug. 21, 1974, 49-95879; Jan. 8, 1975, 50-4776; Jan. 8, 1975, 50-4777; Jan. 8, 1975, 50-4778

Int. Cl.² G06K 9/04

U.S. Cl. 340—146.3 D **3 Claims**



1. A data reading apparatus comprising:
a TV camera having a deflecting mechanism for reading codified data,
a deflecting signal generating circuit for generating a signal to be applied to the deflecting mechanism,
the deflecting signal generating circuit comprising:
an envelope signal generator,
a scan frequency generator,
an envelope positive and negative finding circuit,
a positive gate circuit,
a negative gate circuit,
a positive switch circuit comprising a forward current on circuit and a reverse current on circuit,
a negative switch circuit comprising a reverse current on circuit and a forward current on circuit,
a first diode,
a second diode,
a third diode,
a fourth diode,
a choke coil,
a coupling capacitor,
a resonation capacitor,
a horizontal deflecting coil,
means connecting the envelope signal generator to a first terminal of the choke coil and to the input of the envelope positive and negative finding circuit,
means connecting the scan frequency generator to a second input of the positive gate circuit and to a first input of the negative gate circuit,
means connecting a first output of the envelope positive and negative finding circuit to a second input of the negative gate circuit,
means connecting a second output of the envelope positive and negative finding circuit to a first input of the positive gate circuit,
means connecting the output of the positive gate circuit to the input of the forward current on circuit of the positive switch circuit and to the input of the reverse current on circuit of the positive switch circuit,
means connecting the output of the negative gate circuit to the input of the reverse current on circuit of the negative switch circuit and to the input of the forward current on circuit of the negative switch circuit,
means connecting the output of the forward current on circuit of the positive switch circuit to the cathode of the first diode,
means connecting the output of the reverse current on circuit of the positive switch circuit to the anode of the second diode,
means connecting the output of the reverse current on circuit of the negative switch circuit to the anode of the third diode,
means connecting the output of the forward current on circuit of the negative switch circuit to the cathode of the fourth diode,
means connecting a second terminal of the choke coil to the anode of the first diode, to the cathode of the second diode, to the cathode of the third diode, to the anode of the fourth diode and to a first terminal of the coupling capacitor,
means connecting the second terminal of the coupling capacitor to the resonation capacitor and to the horizontal deflecting coil,
means connecting the resonation capacitor and the horizontal deflecting coil in parallel.

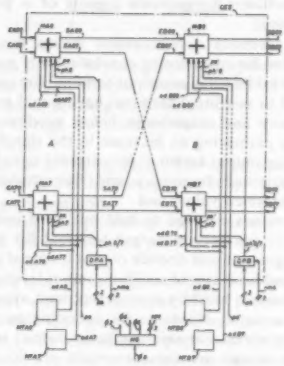
4,001,781
ELECTRONIC SWITCHING ELEMENT

Pierre Charransol; Jacques Hauri, both of Paris, and Serge Robert Fontana, Elancourt, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,604

Int. Cl.² H04Q 3/60; H04J 3/16

U.S. Cl. 340—147 C **4 Claims**

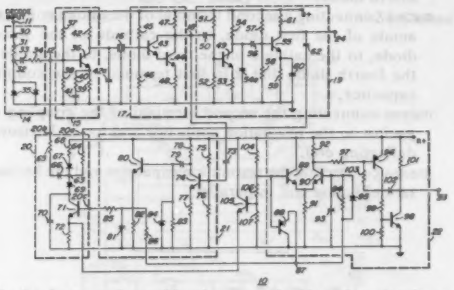


1. A switching network for providing communication from a time division switching stage through a space division switching stage, wherein said space division stage is configured into a plurality of crosspoint matrices, each crosspoint matrix being formed by the intersection of input conductors and output conductors, and in which each of said input conductors is represented by a multiple bit address code, and in which said matrices are grouped within a plurality of modules, with each module having a plurality of commoned output conductors, a control conductor representing each output conductor within a matrix for receiving multiple-bit addresses corresponding to the addresses of input conductors accessible to said matrix, an address register for each said control conductor for storing said multiple bit addresses, a demultiplexer common to a plurality of said modules for receiving clock addressing signals, said demultiplexer forwarding said addressing signals to registers in a sequence, the registers of said groups being serially disposed relative to said demultiplexer for receiving addressing signals and switching enabling signals therefrom for switching a crosspoint responsive to the correlation of the multiple bit input address codes and the clocked addressing signals for an enabled module.

4,001,782
COMBINED ENCODER AND DECODER CIRCUIT

James Valery Motsinger, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 6, 1975, Ser. No. 629,336
Int. Cl.² H04Q 9/08; H03B 3/04, 5/30; H04M 11/02
U.S. Cl. 340—171 R 11 Claims



1. An improved combination encoder/decoder circuit arrangement for providing encoder output signals of a predetermined frequency while simultaneously detecting external input signals having the predetermined frequency and magnitudes above a predetermined value, said circuit arrangement comprising in combination:

a closed loop oscillator having an input terminal, an output terminal, a frequency selective device coupled therebetween, and positive feedback means coupled between said output terminal and said input terminal for enabling said oscillator to generate signals of a predetermined frequency;

negative feedback compensation means coupled to said oscillator for maintaining a substantially constant signal level at said oscillator output terminal for external signals applied to said input terminal having said predetermined frequency and magnitudes below predetermined value and for permitting an increase in the signal level at said oscillator output terminal for external signals having said predetermined frequency and magnitudes above said predetermined value; and

decoder means coupled to said oscillator output terminal and having a decode output terminal for producing decode signals at said decode output terminal in response to the signal level at said oscillator ouput terminal exceeding said constant level by a predetermined amount;

whereby a signal adaptable for encoding purposes is constantly provided at said oscillator output terminal while decode signals are simultaneously provided at said decode output terminal for external signals applied to said input terminal which have magnitudes above said predetermined value.

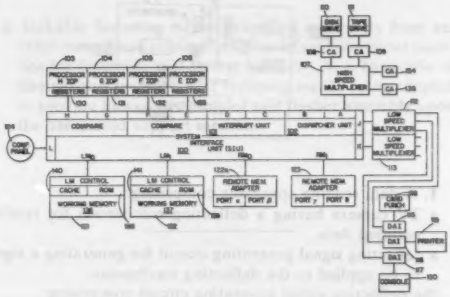
4,001,783
PRIORITY INTERRUPT MECHANISM

Earnest M. Monahan, Phoenix; Garvin W. Patterson, and Jaime Calle, both of Glendale, all of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,315
Int. Cl.² G06F 9/18, 15/16
U.S. Cl. 340—172.5 11 Claims

1. In a data processing system having a plurality of processors coupled to an interface unit via predetermined processor communication channels each processor being selectively controlled by selected ones of a first group of processes, said data processing system also having a plurality of peripheral devices also coupled to aid interface unit via predetermined peripheral channels for communicating with each other and with said processors, said data processing system further having monitoring means for monitoring request signals from a plurality of a second group of processes requesting control and vying with each other for control of one of said processors via one of said processor communication channels, each process and each peripheral channel being associated with a predetermined level of priority, a priority interrupt mechanism included in said interface unit for determining, before interrupting one of said selected first processes, the highest priority peripheral channel of a highest priority second process of said second group of processes requesting control of one of said processor communication channels, and for further determining whether or not said one of said first processes on said one of said processors has a higher priority than said highest priority peripheral channel of the highest priority second process requesting control of said one of said processors, said priority mechanism comprising:

a. first means responsive to said monitoring means for directing said request signals from said second group of



processes to one of said processor communication channels requested by said second group of processes:

b. second means, coupled to said first means, for determining the highest priority of said request signals from said second group of processes;

c. third means for storing the priority level of said currently executing first process on said selectively controlled one of said processors;

d. fourth means coupled to said second means for determining the highest priority level of each peripheral channel of said second group of processes requesting assignment to one of said selected processors; and,

e. fifth means, coupled to said second, third and fourth means, for determining the higher priority level between said currently executing first process and the highest priority peripheral channel of said second process having said highest priority request.

4,001,784
DATA PROCESSING SYSTEM HAVING A PLURALITY OF INPUT/OUTPUT CHANNELS AND PHYSICAL RESOURCES DEDICATED TO DISTINCT AND INTERRUPTIBLE SERVICE LEVELS

Angelo Bardotti, Cesano Boscone (Milan), Italy, assignor to Honeywell Information Systems Italia, Milan, Italy

Filed Dec. 20, 1974, Ser. No. 534,963
Claims priority, application Italy, Dec. 27, 1973, 32162/73
Int. Cl.² G06F 3/04, 9/18
U.S. Cl. 340—172.5 3 Claims

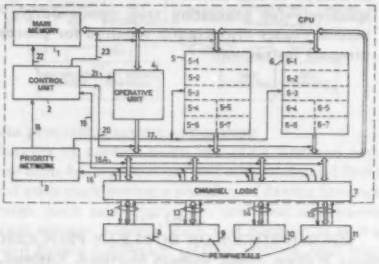
1. In a microprogrammed computer system having a plurality of input/output channels for connecting a central processor to peripheral units, apparatus which comprises:

first means in said central processor for receiving interrupt requests from said peripheral units through said input-/output channels;

second means said central processor coupled to said first means for assigning priority to said interrupt requests, said second means including first assignment means for assigning said interrupt request to priority classes based

on the type of service requested by said interrupt request and second assignment means for assigning priority to said interrupt requests within each said priority class based on the input/output channel carrying said interrupt request; and

a plurality of gating and storage means in said central processor, wherein groups of said plurality of gating and storage means are specifically dedicated to each of said priority classes of interrupt requests for enabling execu-

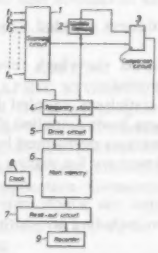


tion of the corresponding type of service, said groups of gating and storage means being responsive to said second means for enabling the execution of a service of another class having higher priority utilizing the one of said gating and storage means specifically dedicated to said higher priority class, wherein a one of said gating and storage means groups can execute a service associated with a one of said priority classes in parallel with execution of a service associated with a second of said priority classes by a second of said gating and storage means groups.

4,001,785
APPARATUS FOR MONITORING CHANGES OF MULTIPLE INPUTS

Ken Miyazaki; Kazutoshi Takahashi, both of Yokohama, and Mamoru Omino, Musashino, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1975, Ser. No. 550,076
Claims priority, application Japan, Feb. 15, 1974, 49-18944
Int. Cl.² G06F *11/00*
U.S. Cl. 340—172.5 **8 Claims**

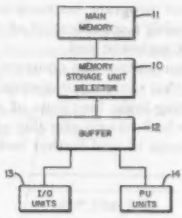


1. An apparatus for monitoring a change in a multiplicity of inputs and comprising a scanning circuit for successively scanning a multiplicity of input points and for outputting binary information indicative of the status of each input point; an update memory for storing the scanned output corresponding to each input point; a comparison circuit for comparing the scanned output of a current cycle against the scanned output of the corresponding input points which was stored during a previous cycle in the update memory, thereby detecting any change in the status of the respective input points; a main memory including a plurality of memory elements which are detachable mounted on a printed substrate and each capable of outputting, when accessed, a binary code indicative of a letter, symbol, numeral or the like which is externally indicated on the memory element, the main memory thus carrying information indicative of the content of the individual input points which are stored in the plurality of memory elements; read-out means responsive to the detection of a change in the comparison circuit for making an access to the main memory at an address corresponding to the input point for which the change is detected; and a recorder for recording the information read out of the main memory and the status of the corresponding input point.

4,001,786
AUTOMATIC CONFIGURATION OF MAIN STORAGE ADDRESSING RANGES

Arthur F. Boehm, Roseville, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 21, 1975, Ser. No. 597,843
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **19 Claims**



1. A system for use in data processing system for selecting one of a plurality of memory storage units which make up main memory, comprising in combination:

a memory storage unit selector connected to each memory storage unit;

first means for providing each memory storage unit selector with the size of the storage capacity of its associated memory storage unit;

second means for providing each memory storage unit selector with a selected portion of the main memory address;

each of said memory storage unit selectors accumulating its size input with the size input of the preceding memory storage unit selector and comparing the resulting accumulations with said selected portion of the main memory address to selected a memory storage unit when said selected portion of the main memory address falls within the range of the sizes accumulated in the associated memory storage unit selector.

4,001,787
DATA PROCESSOR FOR PATTERN RECOGNITION AND THE LIKE

Milton Jay Kimmel, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 272,698, July 17, 1972. This application Jan. 19, 1976, Ser. No. 649,937
Int. Cl.² G06F *1/02, 7/28, 9/20*
U.S. Cl. 340—172.5 **12 Claims**

1. A method for executing a plurality of different voting-logic functions in a data processor, said method comprising:

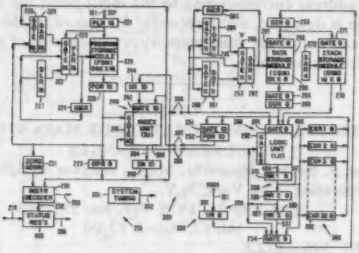
accessing a plurality of program instructions, said plurality of instructions respectively containing specifications of a corresponding plurality of said data operands;

accessing said plurality of data operands according to said specifications;

entering successive ones of said plurality of data operands into a first a plurality of cascaded registers;

thereafter testing for the presence of a fixed value in the operand in said first register;

if said tested operand has a predetermined fixed value, pushing said successive operands from each successive register into the next succeeding register in said plurality of cascaded registers;



accessing a further program instruction, said further instruction containing a specification of a selectable one of said plurality of registers; and

gating to a common output the contents of said selectable one register, so that said output contains one of a plurality of different voting-logic functions of said operands, depending upon which of said plurality of registers it gated thereto in response to said further instruction.

4,001,788

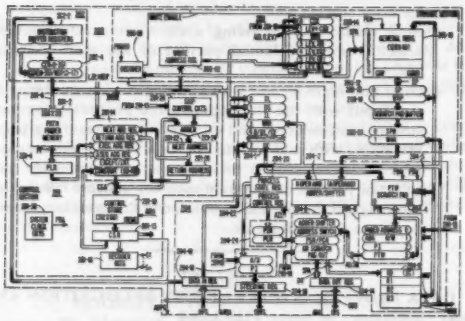
PATHFINDER MICROPROGRAM CONTROL SYSTEM

Garvin Wesley Patterson, Glendale, and Marion G. Porter, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,363

Int. Cl.² G06F *9/16, 9/19*

U.S. Cl. 340—172.5 **20 Claims**



1. A cyclically operable microprogram control system for use in an information handling system for generating subcommand signals for controlling systems operations required for processing program instructions, each program instruction including an operation code, said microprogram control system comprising:

a first store for storing address words, each including a plurality of addresses;

a second store for storing standard sequences of microinstruction words and execution sequences of microinstruction words;

each of said first and second stores including addressing means and output register means for providing access to said store contents and storage for said address and microinstruction words read from said first and second stores respectively; and,

selection means coupled to said output register means of said first and said addressing means of said second stores, said selection means receiving said plurality addresses of an address word read out from said first store in response to said operation code during the processing of said program instruction, said selection means applying selectively each of said plurality of addresses to said addressing means of said second control store for accessing microinstructions of said standard and execution sequences respectively for generating said signals during first and second phases of operation required for processing said program instruction.

4,001,789

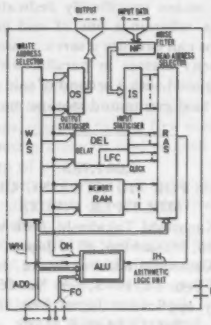
MICROPROCESSOR BOOLEAN PROCESSOR

Anthony William Sweet, Bishops Stortford, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 23, 1975, Ser. No. 580,274

Int. Cl.² G06F *13/00, 13/06, 3/00*

U.S. Cl. 340—172.5 **8 Claims**



1. Electrical data processing equipment, comprising:

a plurality of inputs via which data to be processed is received;

a set of input staticisers coupled to said inputs for storing said data;

a plurality of outputs via which results can be extracted from said equipment;

a set of output staticisers coupled to said outputs, said out-put staticisers having applied thereto results of data processing operations performed by said equipment;

a random access memory for storing intermediate processing results

an instruction input via which instructions are received, each instruction including an address portion and a function portion;

first address selection means coupled to said address portion, said random access memory and said input staticisers for selecting data from said input staticisers to be processed and for retrieving data from said random access memory

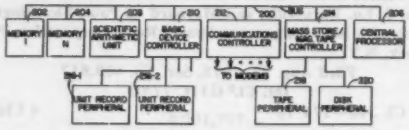
a logic circuit coupled to said function portion and said first address selection means for processing data supplied by said first address selection means; and

second address selection means coupled to said address portion, said logic circuit, said output staticisers and said random access memory for applying outputs of said logic circuit to said output staticisers and said random access memory

4,001,790
MODULARLY ADDRESSABLE UNITS COUPLED IN A DATA PROCESSING SYSTEM OVER A COMMON BUS

George J. Barlow, Tewksbury, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 30, 1975, Ser. No. 591,903
Int. Cl.² G06F 7/10
U.S. Cl. 340—172.5 11 Claims



1. A data processing system comprising:

A. a plurality of control units, including first and second control units having identical unit addresses, said first and second units each having a plurality of device connection positions, each said position in said first unit having a different relative address, each said position in said second unit having a different relative address, said relative addresses of said first unit being identical to said relative addresses of said second unit whereby said first and second units have like designated positions,

B. a common electrical bus, connected to each of said units, for enabling the transfer of information, including data and addresses, wherein said addresses include said unit addresses and said relative addresses, to and from said units;

C. a plurality of peripheral devices;

D. means, included in said first unit, for coupling at least one of said devices with one of said like designated positions,

E. means, included in said second unit, for coupling at least another of said devices with another of said like designated positions, said another of said positions having a different relative address than said one of said positions;

F. means, included in both said first and second units, for receiving the address of said unit and the relative address of one of said positions; and

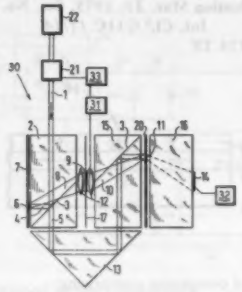
G. means, included in both said first and said second units, for responding to said unit address and said relative address, said first unit making a positive response if it receives said unit address and the relative address of said one of said positions, and said second unit making a positive response if it receives said unit address and the relative address of said another of said positions.

4,001,791
HOLOGRAPHIC STORAGE DEVICE

Horst Kiemle, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 453,067, March 20, 1974, Pat. No. B453,067. This application Sept. 23, 1975, Ser. No. 615,935
Claims priority, application Germany, Mar. 29, 1973, 2315776
Int. Cl.² G11C 13/04
U.S. Cl. 340—173 LM 12 Claims

1. A device for recording information in a holographic storage and for retrieving the information from the storage, comprising a plurality of transparent bodies each having a plurality of flat surfaces, a storage medium disposed between a pair of said bodies which are arranged with adjacent flat surfaces being parallel, a detector matrix being arranged on a surface of one of said pair of bodies opposite the storage medium, a modulator matrix having a condenser-type optical system, said modulator matrix being disposed adjacent the flat surface of the other of said pair of bodies opposite said storage medium, an illumination hologram containing a plurality of sub-holograms spaced from the modulator matrix by one of said transparent bodies, a source providing a beam of coherent illumination directed at one of said bodies, means selectively deflecting the beam at different portions of the body so that the deflected beam is selectively projected on different portions of the storage medium during both recording and retrieving operations, and means directing a portion of the

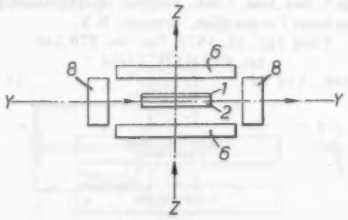


deflected beam onto a sub-hologram of the illumination hologram to create an illumination beam which is focused by the condenser-type optical system on the modulator matrix to form an object wave that is projected on the storage medium, said object wave being spatially modulated with the information to be recorded in a hologram.

4,001,792
DRIVE FIELD FOR CIRCULAR MAGNETIC DOMAIN DEVICES

Michael Dennis Roy Tench, Blisworth, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Apr. 29, 1975, Ser. No. 572,874
Claims priority, application United Kingdom, May 17, 1974, 22014/74
Int. Cl.² G11C 11/14
U.S. Cl. 340—174 TF 8 Claims



1. A circular magnetic domain device which includes a first pair of bias magnets for applying a steady bias magnetic field in a direction normal to a major surface of the device's uniaxial magnetic layer; rotating magnetic field generating means for causing circular magnetic domains generated in the said layer to propagate within the layer along at least one path defined by a permeable circuit pattern formed on the said major surface, the generating means including two pairs of coils having their axes at right angles to each other and in the plane of the said major surface, one pair of coils being operable to provide an oscillating field which is unipolar and stops and starts at zero; and a second pair of bias magnets for applying a steady holding magnetic field in the direction of the magnetic field provided by the said one pair of coils, the steady bias magnetic field being applied to the uniaxial magnetic layer in the plane of the said major surface thereof.

4,001,793

MAGNETIC BUBBLE DOMAIN COMPOSITE WITH HARD BUBBLE SUPPRESSION

Rodney D. Henry, Corona, and Paul J. Besser, Laguna Niguel, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 375,999, July 2, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,859

Int. Cl.² G11C 11/14

U.S. Cl. 340—174 TF 22 Claims

1. A stratified composite comprising:

a non-magnetic, monocrystalline garnet substrate;

a bubble domain layer of an epitaxially grown monocrystalline magnetic garnet material, said bubble domain layer overlying said substrate, having a major surface and having sufficient uniaxial anisotropy to enable the formation of bubble domains therein;

a hard bubble suppression layer of an epitaxially grown monocrystalline magnetic garnet material, said hard bubble suppression layer overlying said substrate on the same side as said bubble domain layer, having a major surface, a thickness of less than about 0.5 μ and sufficient anisotropy to establish a net moment of magnetization substantially parallel to said major surface of said hard bubble suppression layer;

said bubble domain and hard bubble suppression layers having their major surfaces substantially parallel; and

said substrate supporting said layers along their major surfaces.

4,001,794

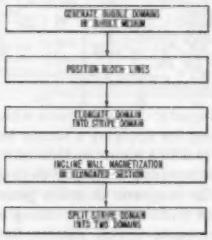
METHOD AND APPARATUS FOR CONTROLLED GENERATION OF WALL TOPOLOGY IN MAGNETIC DOMAINS

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,146

Int. Cl.² G11C 11/14

U.S. Cl. 340—174 TF 16 Claims


GENERATE BUBBLE DOMAINS IN BUBBLE MEDIUM
POSITION BLOCH LINES
ELONGATE DOMAIN INTO STRIPE DOMAIN
INCLINE WALL MAGNETIZATION IN ELONGATED SECTION
SPLIT STRIPE DOMAIN INTO TWO DOMAINS

1. A process for controllably generating wall states in magnetic bubble domains in a medium supporting said domains, said wall states capable of representing data information, said process comprising the steps of:

a. generating a bubble domain in said medium;

b. positioning Bloch lines, if any, in said generated domain;

c. elongating said generated domain to obtain a stripe domain;

d. inclining the wall magnetization in the elongated section of said stripe domain substantially transverse to said domain wall; and

e. splitting said stripe domain into two bubble domains.

4,001,795

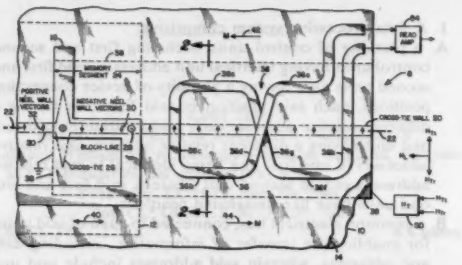
MAGNETO-INDUCTIVE READOUT OF CROSS-TIE WALL MEMORY SYSTEM USING HARD AXIS DRIVE FIELD AND NOISE CANCELLING SENSE LINE

David S. Lo, Burnsville, and Maynard C. Paul, Bloomington, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,817

Int. Cl.² G11C 11/02

U.S. Cl. 340—174 TF 4 Claims



1. In a cross-tie wall memory system in which bits of binary data are stored as inverted Neel wall sections, which inverted Neel wall sections are bounded by a cross-tie on one end and by a Bloch-line on the other end, in a cross-tie wall in a magnetizable layer having an easy axis and in which said binary data are serially propagated along said cross-tie wall by the interacting fields provided by associated drive lines, which drive lines have memory segments that are associated with associated memory cells in said magnetizable layer in which associated ones of said bits of binary data are stored as inverted Neel wall sections, a method of magneto-inductively reading out said bit-defining-Bloch-lines that are representative of stored binary data comprising:

aligning a noise cancelling sense line loop straddled about said cross-tie wall;

coupling a sense amplifier to said sense line loop;

coupling a hard axis drive field H_T to a bit-defining-Bloch-line that is stored in said memory segment;

driving said bit-defining-Bloch-line along said cross-tie wall, out of said memory segment and into said sense line loop;

sensing the passage of said bit-defining-Bloch-line out of said memory segment and into said sense line loop by said sense amplifier.

4,001,796

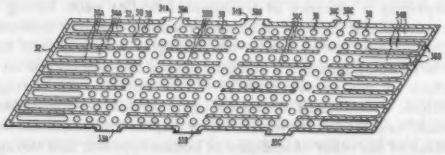
BUBBLE LATTICE STRUCTURE WITH BARRIER

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 494,940, Aug. 5, 1974, Pat. No. 3,930,244. This application June 16, 1975, Ser. No. 587,481

Int. Cl.² G11C 11/14

U.S. Cl. 340—174 TF 14 Claims



1. A bubble lattice system comprising

a plurality of substantially parallel rows of movable domains, said domains adapted to move from a first position to a second position in said row, and

a barrier positioned between two of said rows wherein said barrier maintains the relative position of said domains in said two rows adjacent said barrier as said domains move from said first position to said second position.

4,001,797

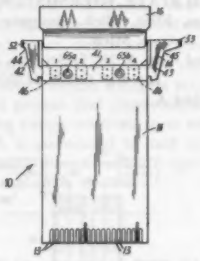
ANNUNCIATOR SYSTEM WITH DIRECT FIELD WIRING

Gerald H. Buss, Walworth; Chester H. Clarridge, Pittsford, and Daniel H. Hollands, Webster, all of N.Y., assignors to Rochester Instrument Systems, Inc., Rochester, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,524

Int. Cl.² G08C *9/00*

U.S. Cl. 340—181 **8 Claims**



1. A terminal system for an annunciator or similar system comprising

a first printed circuit board which has thereon wires for a plurality of circuits, a top support member and a bottom support member each secured to said board at respectively near its top and bottom portions,

an elongated channel member secured to said first circuit board and having a bottom wall and two side walls, a plurality of connector members secured to said bottom wall and electrically connected to said first printed circuit board,

a plurality of module circuit boards each having conductive contact means near one of its sides which contact said connector members on said first printed circuit board, means on said two side walls of said channel member in facing relationship to removably position said module circuit boards,

an electrically insulative handle terminal block fastened to each of said module circuit boards at the side opposite said connector means, each of said handle terminal blocks having a handle portion, a plurality of conductive connector members, and means connecting each of said connector members to the wires on its module printed circuit board,

a plurality of electrically insulative field terminal block members, each terminal block member being removably fitted to each of said handle members, each having a plurality of inner conductive connector members which make electrical contact with said connector members of said handle and each having an outer conductive connector member to removably fasten field wiring thereto, said inner and outer conductive members being electrically connected and each of said field terminal block members having a plurality of faces parallel to each other and angled relative its bottom face, each of said faces carrying thereon one of said outer connector members.

4,001,798

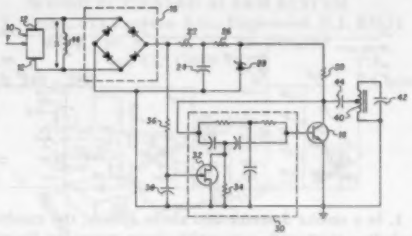
SELF-CONTAINED SENSOR

Roland L. Robinson, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 18, 1975, Ser. No. 614,578

Int. Cl.² G08C *19/38*

U.S. Cl. 340—191 **1 Claim**



1. A self-contained sensor, comprising:

a transducer for converting a physical stimulus to an equivalent electrical signal;

a voltage controlled oscillator having a resistive-capacitive twin-T network in its feedback path, including a field effect transistor operated as a voltage controlled resistor in the middle leg resistor of said twin-T network;

circuit means for applying the equivalent electrical signal to said oscillator for powering it including means for rectifying and filtering the signal;

circuit means for frequency modulating the output of said oscillator by the equivalent electrical signal by applying it to said field effect transistor, including means for rectifying and filtering the signal, and

circuit means for transmitting the modulated output of said oscillator to a remote location.

4,001,799

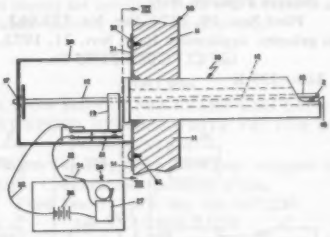
KILN ALARM

Dominic P. Sondy, 1609 Mills Ave., North Muskegon, Mich. 49445

Filed July 9, 1975, Ser. No. 594,329

Int. Cl.² H01H *37/76*; **G08B** *29/00*

U.S. Cl. 340—213 Q **10 Claims**



1. In combination with a kiln, an alarm system including:

an elongated member pivotally mounted outside the kiln and extending into the kiln;

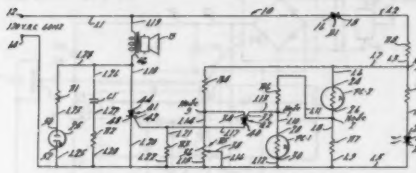
a tube surrounding the extension of the elongated member into the kiln and having a partially removed end portion to provide an arced integral sector providing spaced mounting surfaces for horizontally supporting the ends of an elongated pyrometric cone used to support an end of the elongated member; and

a signaling device mechanically coupled to the elongated member and activated by downward sagging of the elongated member resulting from the deformation of said pyrometric cone.

4,001,800
SMOKE DETECTING DEVICE

Jeffrey L. Franks, Holland, Mich., assignor to Gentex Company, Holland, Mich.

Continuation-in-part of Ser. No. 482,435, June 24, 1974, abandoned. This application May 19, 1975, Ser. No. 578,612
Int. Cl.² G08B 17/10
U.S. Cl. 340—237 S **30 Claims**

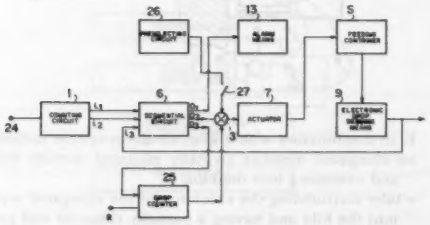


1. In a smoke detector and alarm system, the combination including electrically activatable alarm means, an illuminating circuit including a light emitting diode, means providing a pulsating current supply for said light emitting diode whereby said light emitting diode emits pulsating light, a smoke sensing and compensation circuit including dual photo-electric means the electrical conductivity of each of which varies as a function of the amount of light impinging thereon, said dual photo-electric means being connected in series and being electrically connected to said means providing a pulsating current supply for said light emitting diode, said dual photo-electric means being mounted in proximity to said light emitting diode whereby light emanating from said light emitting diode impinges upon one of said dual photo-electric means at all times and impinges upon the other of said dual photo-electric means to change the conductivity of said other dual photo-electric means only when airborne particulate matter is present in the ambient atmosphere, solid state trigger means activatable in response to a differential in the conductivity of said dual photo-electric means, and solid state switching means controlling the activation of said alarm means and controlled by said trigger means.

4,001,801
AUTOMATIC LOW THROUGHPUT METERING APPARATUS FOR SELECTING AND CONTROLLING THE FLOW RATE OF LIQUIDS

Camille Moulet, Le Cannet, France, assignor to Crinospital S.p.A., Palazzo Pignano, Italy

Filed Nov. 19, 1974, Ser. No. 525,063
Claims priority, application Italy, Nov. 21, 1973, 31502/73
Int. Cl.² G08B 21/00
U.S. Cl. 340—239 R **5 Claims**

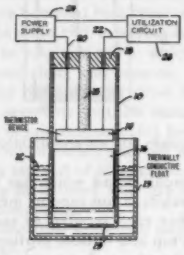


1. A metering apparatus for a liquid adapted to be placed between a liquid feeding container and a flow delivery line, comprising: an actuator for delivering liquid drops from the feeding container to the flow delivery line; a counting circuit, means for presetting said counting circuit to a desired flow rate of liquid drops deliverable to the flow delivery line, a control apparatus including a sequential circuit having an input coupled to said counting circuit and an output coupled to said actuator for controlling said actuator to deliver liquid drops, according to the preset rate, to the delivery line; means at the output of the metering apparatus for electronically sensing the actual delivered drops and providing an output proportional to the rate of drops actually delivered to the flow delivery line, said output being coupled to said sequential circuit and alarm means coupled to said sequential circuit and operable to cause an alarm in response to sensing a disparity between the rate of the drops delivered and the drop rate preset by said counting circuit, said counting circuit including an oscillator providing an output signal, a plurality of digital counters connected as frequency dividers for the output signal of the oscillator and a plurality of inverters connected to some outputs of the counters, a slider for presetting the delivery flow rate of the metering apparatus and connecting one of the outputs of the inverters to an input of the control apparatus, the two outputs of said counters having the highest frequencies being directly connected with two corresponding inputs of the control apparatus in order to clock the sequential circuit.

4,001,802
SOLID STATE THERMISTOR SWITCH

Douglas I. Fales, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1975, Ser. No. 601,597
Int. Cl.² G08B 21/00
U.S. Cl. 340—244 A **2 Claims**



1. A condition responsive switch coupled with a current supply comprising

a thermistor means connected to the current supply to develop a relatively high temperature and one resistance value when exposed to a medium of low thermal conductivity and a lower temperature and a substantially different resistance value when exposed to a medium of relatively high thermal conductivity,

a solid state medium of high thermal conductivity having a first position in thermal contact with the thermistor means to effect cooling thereof and a second position out of thermal contact with the thermistor means to allow heating thereof,

means responsive to a condition for moving the solid state medium between said first position and said second position,

and, means responsive to the resistance value of the thermistor means to thereby indicate whether the solid state medium is in said first position or said second position thereby providing an indication of the condition.

4,001,803
LIGHTING DEVICES

Dominick A. Lombardo, 5 Cottage St., Norwalk, Conn. 06856

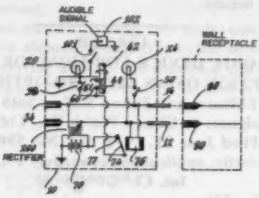
Filed Oct. 1, 1975, Ser. No. 618,380
Int. Cl.² G08B 21/00
U.S. Cl. 340—248 B **24 Claims**

1. A lighting unit comprising a protective housing in which

are positioned a main circuit terminating in a pair of connector prongs for insertion into corresponding conductive receptacles of an electrical power source, said prongs being selectively extendable from said unit parallel to each other by having one of their respective ends swung outward therefrom,

a first lighting circuit which is electrically connected to said main circuit and to a first lamp and includes a manually operable on-off switch positioned between said lamp and said main circuit,

a second lighting circuit which is isolated electrically from said main circuit and said first circuit and electrically



interconnects a battery with a second lamp through a normally closed switch and through two switches which are in series with said normally closed switch and are in parallel with each other, one of which parallel switches is a manually operable on-off switch and the other of which switches is an on-off switch which is mechanically integrated with said prongs and closes simultaneously with said prongs being swung outward from said unit,

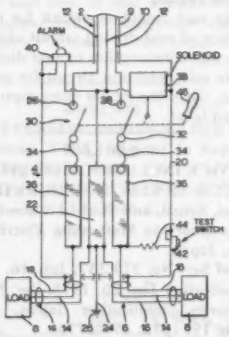
and a relay which is connected to said main circuit and causes said normally closed switch to open in response to energization of said main circuit.

4,001,804

GROUND FAULT PROTECTION FOR ELECTRICAL POWER DISTRIBUTION SYSTEMS

Fred W. Irving, New Minas, Canada, assignor to I-T Safety Enterprises Limited, Berwick, Canada

Filed Nov. 25, 1974, Ser. No. 526,858
Int. Cl.² G08B 21/00
U.S. Cl. 340—255 **15 Claims**



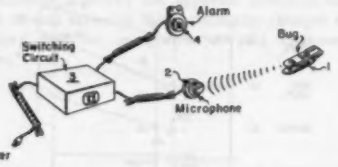
1. In an electrical installation having a supply main comprising a neutral conductor and at least one line conductor, a plurality of branch circuits, a service entry box establishing connection between the supply main conductors and the branch circuits and including manually operable switch means to interrupt the at least one line conductor, and a ground return system establishing a ground return path to the entry box in parallel with each of the branch circuits, the improvement wherein the ground return system and the service entry box are isolated from all neutral conductors in the installation, the switch means is biased to an open condition and includes latch means releasably to latch it in a closed condition, and the service entry box contains a solenoid electrically connected between the box and the neutral conductor and responsive to the passage of a predetermined current to release said latch means in the box.

4,001,805

SOUND ACTIVATED ALARM SYSTEM

Alvin V. Golbe, 311 Lantana Ave., Englewood, N.J. 07631

Filed Apr. 3, 1975, Ser. No. 564,759
Int. Cl.² G08B 21/00
U.S. Cl. 340—280 **7 Claims**



1. An alarm system for monitoring and responding to removal of an object from its proper place comprising:

a. a portable generator means for positioning between said object and an associated fixed support for the object, said generator means including:

1. a base,

2. a blade fixed at one end to the base with its other end free and normally disposed in a first position extending at an acute angle away from the base and movable to a second position engaging said base, said blade being armed upon restraining said free end in said second position by positioning between said object and support, said blade further being mechanically formed for generating an audible sound having a predetermined frequency upon movement of its free end from said second position to said first position upon removal of said object from said support;

b. circuit means including a source of electrical power;

c. signal means connected into said circuit means and responsive to said audible sound for providing an electrical output, said signal means being disposed remotely of said generator means; and

d. alarm means for signalling the removal of said object from said support, said alarm means included within said circuit means for actuation from a first state to an alarm state under control of said signal means.

4,001,806

DEFLECTION SIGNAL PRE-START CIRCUIT FOR A CONSTANT SPEED, STROKE-WRITE VECTOR DISPLAY SYSTEM

Charles William Sweeting, Norwalk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 7, 1976, Ser. No. 647,230
Int. Cl.² G06K 15/20
U.S. Cl. 340—324 A **7 Claims**

1. An improved constant speed stroke-write vector display system, of the type which includes,

a CRT video display,

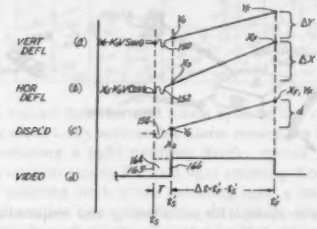
vector generator means for providing, a pair of start position signals and a pair of end position signals that together define the start position and end position of a vector in each of two orthogonal coordinates, a pair of rate magnitude signals which are proportional to the orthogonal components of the stroke vector deflection angle in each of the orthogonal coordinates, and a video start signal,

deflection means responsive to the vector generator, for providing deflection signals in each of the two orthogonal coordinates, each signal having an amplitude rate of

change with time in dependence on a respective one of the rate magnitude signals, and each signal having a start value and a stop value in dependence on the respective start positon and end position coordinate signals in each of the two orthogonal coordinates,

a video means responsive to the vector generator and to the deflection circuits for providing a video gate signal beginning in response to the video start signal and ending in response to each of the deflection signals attaining a magnitude corresponding to the vector end position signals,

the improvement comprising:



delay means responsive to the gated video switch for delaying the video gate signal for a determined time interval and for applying the resulting delayed video signal to the CRT display; and

deflection offset means responsive to the vector generator for providing a pair of deflection offset signals, each corresponding to the start value of the deflection signals in a different one of the two orthogonal coordinates, and each having a magnitude which is proportional to and of a polarity opposite to the rate magnitude signal in a respective one of the orthogonal coordinates, said offset means summing each of the deflection offset signals to a related one of the deflection signals and providing the summed deflection signals to the CRT display.

4,001,807

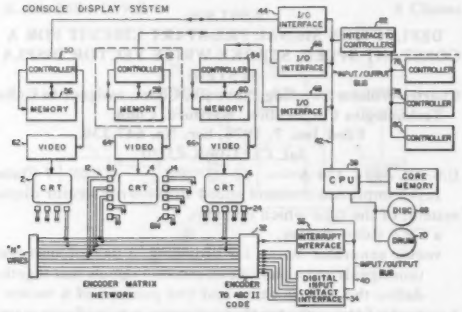
CONCURRENT OVERVIEW AND DETAIL DISPLAY SYSTEM HAVING PROCESS CONTROL CAPABILITIES

Renzo Dallimonti, Ambler, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 388,949, Aug. 16, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,321

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 A **10 Claims**



1. A display system comprising:

a display panel means having at least a first and a second display means having respective display faces for displaying a plurality of corresponding displays on each display face, said displays being interrelated and separately characterized wherein said first display means displays an overview of a plurality of variables, and said second display means displays a detailed display of one of the variables displayed on said first display means,

a plurality of separately actuable means associated with each of said display means, and

control means connected between said display means and said actuable means to control each of said plurality of dislay means in response to an actuated one of said actuable means whereby to select a detailed display for display on said second display means in response to said actuable means associated with said first and said second display means.

4,001,808

ELECTRONIC DEVICE FOR MONITORING POWER CONSUMPTION OF AN ELECTRO-OPTICAL DISPLAY

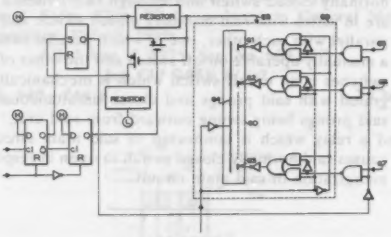
Heihachiro Ebihara, and Fukuo Sekiya, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 25, 1975, Ser. No. 590,197

Claims priority, application Japan, July 17, 1974, 49-81867

Int. Cl.² G09F *9/32*

U.S. Cl. 340—336 **17 Claims**



1. An electronic device for use with electronic appliances, wherein said appliances include a battery cell for supplying electric power, a reference signal generator for generating a reference signal, logic circuitry responsive to said reference signal for supplying an operating signal for driving said display device, wherein said device comprises:

a detection circuit disposed between said battery cell and said driving circuit;

means within said detection circuit for monitoring power consumption of said driving circuit and thereby measuring the power consumption of said display device;

means within said detection circuit for generating a detection signal, when the power consumption exceeds a predetermined level.

4,001,809

DISPLAY DEVICE INCLUDING CIRCUITS FOR DRIVING LOADS SUCH AS ELECTROPHORETIC DISPLAYS

Kiyotake Fukui, Settsu, and Shuichi Ninomiya, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 379,337, July 16, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 543,007

Claims priority, application Japan, July 19, 1972, 47-72778; July 19, 1972, 47-72779

Int. Cl.² G09F *9/32*

U.S. Cl. 340—336 **6 Claims**

1. A display device of the type which is required to be operated by both polarities of voltage supplied thereto, said display device comprising:

a display panel including a segmented electrode having a plurality of segmental electrodes, a common electrode, and an electrophoretic suspension sandwiched between said common electrode and each of said segmental electrodes;

a plurality of segment driving devices, one each connected to one of said segmental electrodes;

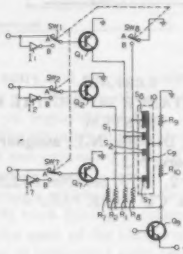
a voltage supply means for supplying a D.C. voltage to said display panel;

a display controlling device coupled in series with said voltage supply means and the respective segment driving devices and in series with said voltage supply means and said common electrode;

a first resistive element having two ends, one end being connected to each of said segmental electrodes;

a second resistive element having two ends, one end of said second resistive element being connected to said common electrode and a second end of said second resistive element being connected to a second end of said first resistive element;

a third resistive element having two ends, one end of said third resistive element being connected to said plurality of segment driving devices and a second end of said third resistive element being connected to said common electrode;



said display controlling device comprising means for providing a voltage across said segmental electrodes and said common electrode through said segment driving devices only when said display controlling device is in a short-circuited condition;

said electrophoretic suspension between said common electrode and one of said segmental electrodes being driven so as to display an indication when said display controlling device and one of said segment driving devices connected to said one of said segmental electrodes are in a short-circuited condition; and

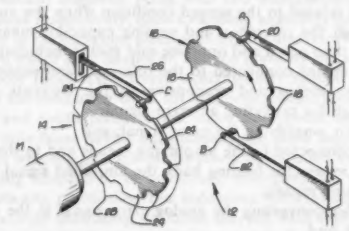
said indication of said electrophoretic suspension being erased when said one of said segment driving devices reaches an open-circuited condition and said display controlling device returns to the short-circuited condition.

4,001,810

SEQUENCE REVERSING BORDER LIGHT DISPLAY

Roy Olsen, Rosemead, Calif., assignor to Superior Outdoor Display, Inc., Long Beach, Calif.

Filed Dec. 18, 1975, Ser. No. 641,838
Int. Cl.² G08B *5/36*
U.S. Cl. 340—338 **2 Claims**



1. In an illuminated display:

a. a series of lights arrayed in a line;

b. three interruptible circuit means segregating the lights into three interpositioned groups;

c. first timing means for cyclically operating two of the circuit means so that the OFF periods of the corresponding groups are substantially out of phase;

d. second timing means for operating the third circuit means so that the lights of the third group have two cyclic modes, in one of which the OFF periods of said third group lead the OFF periods of said first group and follow the OFF periods of said second group and in the other of which the OFF periods of said third group follow the OFF periods of said first group and lead the OFF periods of said second group; and

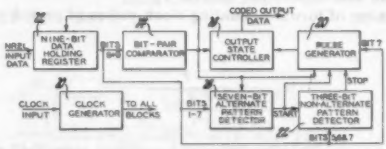
e. common drive means for operating said timing means in synchronism whereby the apparent direction of movement of said series of lights cyclically changes notwithstanding uniform movement of said common drive means.

4,001,811

METHOD AND APPARATUS FOR CODING AND DECODING DIGITAL INFORMATION

Duane E. McIntosh, Palmyra, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1972, Ser. No. 221,693
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD **7 Claims**



1. Apparatus for converting an input bit stream the data of which is contained in the level of the input bit stream, to an output bit stream wherein the content of the data is contained in the time of transition of the output bit stream relative to bit time of the output bit stream, said apparatus comprising:

storage means;

clock means for shifting said input bit stream into said storage means, said clock means including means for establishing the bit time of said output bit stream;

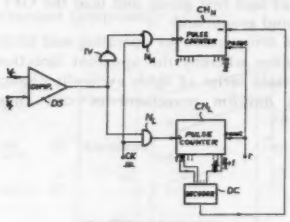
means responsive to said clock means for comparing the level of adjacent bits in said input bit stream and for developing a control signal having pulses which occur at a first time with respect to bit time upon detection of a discrete pair of adjacent bits at one logic level and at a second time with respect to bit time upon detection of a discrete pair of adjacent bits at a second logic level and for generating pulses separated by 1½ bit time intervals when at least seven bits between discrete pairs of like bits form an alternate bit pattern, the first pulse of said 1½ bit time interval pulses occurring either 2 or 2½ bit times following the pulse corresponding to the detection of the first of said discrete pairs of like bits depending upon which alternate bit pattern is formed, the last pulse of said 1½ bit time interval pulses occurring at least 2 bit times prior to a pulse corresponding to detection of the second of said discrete pairs of like bits;

and means responsive to the pulses in said control signal for developing an output bit stream having state transitions corresponding to each pulse in said control signal.

4,001,812
METHOD OF AND MEANS FOR QUANTIZING ANALOG-VOLTAGE SAMPLES

Giorgio Testa, Milan, and Mario Pozzi, Mozzate, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed May 15, 1975, Ser. No. 577,673
Claims priority, application Italy, May 15, 1974, 22728/74
Int. Cl.² H03K *13/20*
U.S. Cl. 340—347 NT 7 Claims



1. In a signaling system including means for periodically sampling an analog voltage ranging between a lower limit V_{min} and an upper limit V_{max}, the combination therewith of analog/digital conversion means comprising:

an input capacitor chargeable with an analog-voltage sample at the beginning of a digitization interval T_x forming part of a recurrent sampling cycle;

a first constant-current generator connected across said input capacitor for linearly discharging same at a relatively high rate sufficient to reduce its voltage from said upper limit V_{max} to said lower limit V_{min} in not more than half said digitization interval T_x;

a source of forward-counting clock pulses of period

$$T = \frac{T_x}{2^{n/2} + 1}$$

timed to coincide with $2^{n/2}$ major quantum steps into which the voltage range $V_{max} - V_{min}$ is divided, each major quantum step being subdivided into $2^{n/2}$ minor quantum steps of uniform height, n being an even integer;

a second constant-current generator connected across said input capacitor for linearly charging same at a relatively low rate corresponding to a minor quantum step per clock pulse;

a supply of reference voltage corresponding to said lower limit V_{min};

discriminating means connected to said input capacitor and to said supply for comparing the capacitor voltage with said reference voltage;

first and second switch means controlled by said discriminating means for respectively actuating said first generator upon said capacitor voltage exceeding said reference voltage and said second generator upon said reference voltage exceeding said capacitor voltage, said first switch means being responsive to said clock pulses for terminating the discharge of said input capacitor by said first generator only after a whole number of pulse periods T upon said capacitor voltage dropping below said reference voltage to cause actuation of said second generator;

first binary counting means connected to be stepped by said forward-counting pulses under the control of said discriminating means during the discharging of said input capacitor by said first generator, thereby producing a first group of $n/2$ bits representing the number of major quantum steps counted;

second binary counting means connected to be stepped by said forward-counting pulses under the control of said discriminating means during the charging of said input capacitor by said second generator until said capacitor voltage substantially equals said reference voltage, thereby producing a second group of $n/2$ bits representing the number of minor quantum steps counted; and

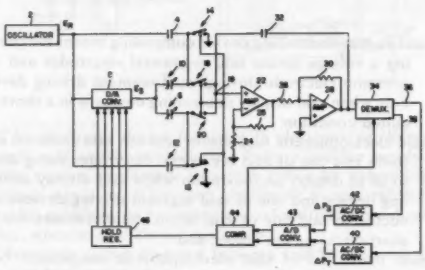
circuit means connected to said first and second counting means for combining said first and second groups of bits into a binary word representative of the magnitude of said analog-voltage sample;

said second counting means having a capacity exceeding $2^{n/2}$ and being provided with decoding means for detecting a count of $2^{n/2}$, said first counting means being provided with a reverse-stepping input connected to said decoding means for reducing the count thereof by one upon said second counting means reaching the count of $2^{n/2}$.

4,001,813
PRECISION CAPACITANCE TO DIGITAL CONVERSION SYSTEM

Henry R. Kosakowski, Denville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed July 2, 1975, Ser. No. 592,585
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 R 6 Claims



1. A capacitance to digital conversion system comprising:

a signal source for providing an alternating reference signal;

reference capacitor means connected to the signal source and driven by the reference signal therefrom;

a digital to analog converter connected to the reference signal source and driven by the reference signal therefrom for converting a digital signal to an analog alternating signal;

condition sensing capacitor means connected to the digital to analog converter and driven by the analog alternating signal therefrom;

means connected to the reference capacitor means and to the sensing capacitor means for providing an analog error signal related to the sensed condition when the currents through the reference and sensing capacitor means are other than equal and opposite said means including summing means connected to the reference and sensing capacitor means and responsive to the currents therethrough for providing an error signal;

means for amplifying the error signal; and

means connected to the amplifying means and to the summing means for feeding back the amplified signal to the summing means;

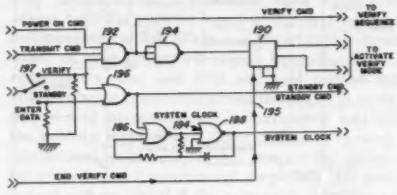
means for converting the analog error signal to the digital signal; and

means for feeding the digital signal to the digital to analog converter for conversion thereby to the analog alternating signal.

4,001,814
FIXED FORMAT MESSAGE ENTRY DEVICE WITH ELECTRONIC STORAGE AND EDITING

Derek S. Morris, Allenhurst, and Robert M. Braun, Eatontown, both of N.J., assignors to The United States of America as represented by the United States Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,643
Int. Cl.² G08C *1/00*
U.S. Cl. 340—365 R **11 Claims**



1. In a data entry and storage system comprising: display means including a multiplicity of indicator blocks each including a plurality of segments of fiber optic material bonded together and a like plurality of individual light-emitting diodes juxtaposed with corresponding ones of said segments;

selectable loosely bound format cards having openings therein through which said indicator blocks pass, said format cards each having a column of indicia imprinted thereupon for each of the indicator blocks to identify the significance of individual light-emitting diodes, said format cards being selected to establish each of the indicator blocks as an indicator of distinctive types of data;

storage means having a number of discrete storage locations;

keyboard means having a plurality of keys selectably actuated one at a time in sequence for presenting data to a distinct location of said storage means for each key actuation which data is in accordance with the particular item of columnar indicia to be selected for each of said columns in the order in which the columns are arranged on said format cards; and

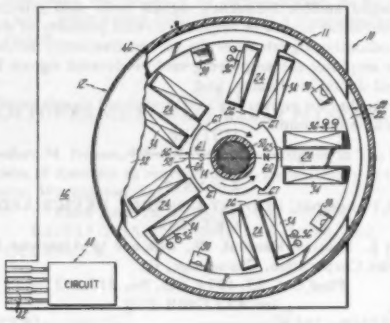
means connected to said storage means for selectively energizing, for each indicator block, that individual light-emitting diode which corresponds to the actuated key to visually display the entered data.

4,001,815
ROTARY ELECTROMAGNETIC INDICATOR

John G. Gamble, Simsbury, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed June 5, 1975, Ser. No. 584,218
Int. Cl.² G08B *5/00*
U.S. Cl. 340—373 **8 Claims**

1. In a rotary indicator comprising an indicating rotor having a permanent magnet with diametrically opposed north and south salient magnetic poles with two diametrically opposed pole faces respectively, each extending angularly substantially equally in both angular directions from a diametral axis of the rotor, a stator core having an uneven plurality of salient poles with pole faces respectively equiangularly spaced about the axis of the indicating rotor for magnetic cooperation with the north and south poles of the rotor permanent magnet, the stator pole faces having substantially the same angular width, a stator winding on each of the stator poles, each stator winding being adapted to be selectively energized for selectively magnetically positioning the indicating rotor in each of two 180° reverse indicating positions thereof with said diametral axis aligned with the respective stator pole face; the improvement wherein each of the two diametrically opposed pole faces of the rotor permanent magnet has an angular width greater than the equiangular spacing of the stator pole faces by an amount no greater than said angular width of the stator pole faces whereby any one of the stator windings can be

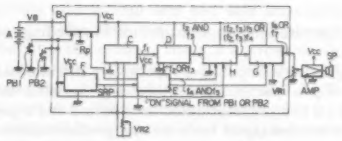


selectively energized to align a selected rotor pole face with the respective stator pole face and to align the opposite rotor pole face with the opposite pair of stator pole faces.

4,001,816
ELECTRONIC CHIME

Kiyoshi Yamada; Kazushige Morisue, both of Hirakata; Hiroshi Shimomura, Ibaragi, and Yoshio Imamura, Kusatsu, all of Japan, assignors to Matsushita Electric Works, Ltd. and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Jan. 19, 1976, Ser. No. 650,450
Claims priority, application Japan, Jan. 21, 1975, 50-9587
Int. Cl.² G08B *1/00*
U.S. Cl. 340—384 E **10 Claims**



1. An electronic chime comprising:

a. a current source,

b. at least a calling push button,

c. a switching circuit connected to said current source and calling push button for feeding a supply voltage to all attached component circuits by an operation of said push button and interrupting said supply voltage upon receiving a resetting signal,

d. an oscillating circuit for generating a standard frequency clock pulse upon receiving the supply voltage,

e. a first frequency divider for generating at least two signals of different audible frequencies upon receiving said clock pulse from said oscillating circuit,

f. an initial condition determining circuit for generating a one-shot pulse signal upon actuation of the push button,

g. a second frequency divider receiving said at least two signals from said first frequency divider and one-shot pulse signal from said initial condition determining circuit and generating at least a rhythm determining pulse signal and a plurality of digital modulation signals, and further generating a resetting pulse to be applied to said switching circuit,

h. a selective controlling circuit receiving said audible frequency signals from said first frequency divider and said rhythm determining pulse signal from said second frequency divider to alternately arrange the audible fre-

quency signals at a rhythm determined by the rhythm determining pulse signal,

i. a digital modulator for modulating said alternately arranged audible frequency signals from said selectively controlling circuit in response to said plurality of digital modulation signals from the second frequency divider,

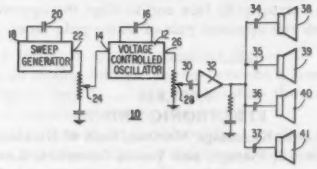
j. an amplifier for amplifying said modulated signals from said digital modulator, and

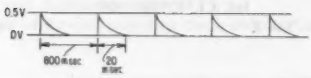
k. a speaker for converting said modulated signals amplified to a chime sound.

4,001,817
ULTRASONIC RODENT CONTROL DEVICE AND METHOD

Robert L. Squires, Rantoul, Ill., assignor to American Electronics Corporation, Champaign, Ill.

Filed Oct. 23, 1974, Ser. No. 517,172
Int. Cl.² G08B 3/00
U.S. Cl. 340—384 E **18 Claims**





1. A signal generation apparatus for use in repelling rodents comprising:

control signal means operative repetitively and alternatively to develop a particular continuously variable control signal for a first predetermined time period and a particular fixed control signal for a second predetermined time period;

square wave generation means for generating ultrasonic square wave signals within a particular range of frequencies, said generation means being coupled to said control signal means and operative in response to said continuously variable control signal to continuously vary said square wave frequency over a particular frequency range during said first predetermined time period and operative in response to said particular fixed control signal to maintain a predetermined square wave frequency for said second predetermined time period and,

transducer means coupled to said square wave generation means for converting said square wave signals to sound waves.

4,001,818
DIGITAL CIRCUIT FAILURE DETECTOR

Frank Radichel, Thornton, and Richard Wirkkanen, Broomfield, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

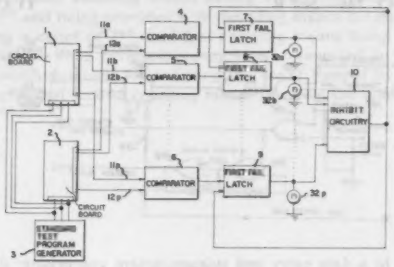
Filed Oct. 22, 1975, Ser. No. 624,610
Int. Cl.² G08B 21/00
U.S. Cl. 340—415 **6 Claims**

1. A failure detector for circuit boards each having electronic circuits thereon at least some of which are serially connected so that an error signal caused by a failure of a circuit is propagated through successive circuits comprising:

a first set of lines connectable to the outputs of a plurality of circuits on a first circuit board,

a second set of lines connectable to the outputs of corresponding circuits on a second circuit board which is the same as said first circuit board,

a plurality of comparators, one for each line in said first set, corresponding lines in said first and second sets of lines being simultaneously applied to each comparator, each



comparator producing an error output representing the difference between the outputs on corresponding lines of said first and second sets,

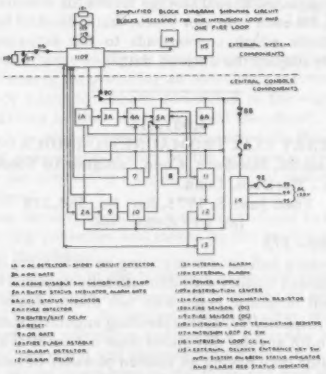
a plurality of first failure latches, one for each comparator, the error output of each comparator being applied to set the corresponding latch, and

inhibit circuitry responsive to the first occurring error output for inhibiting the further setting of first failure latches.

4,001,819
ALARM SYSTEM FOR COMBINED HAZARD DETECTIONS

James W. Wise, Oxon Hill, Md., assignor to Wise Security Corporation, Washington, D.C.

Filed Jan. 31, 1975, Ser. No. 545,829
Int. Cl.² G08B 19/00
U.S. Cl. 340—420 **32 Claims**



1. Alarm system comprising, in combination, first voltage source means for providing a first reference voltage, second voltage source means for providing a second reference voltage, third voltage source means for providing a detection voltage across a pair of terminals for a protective loop circuit within a protective zone, comparator means for comparing the voltage drop developed across said terminals with said first and second reference voltages, and alarm indicator means connected with said comparator means for producing an output signal if the voltage drop across said terminals is not intermediate said first and second reference voltages,

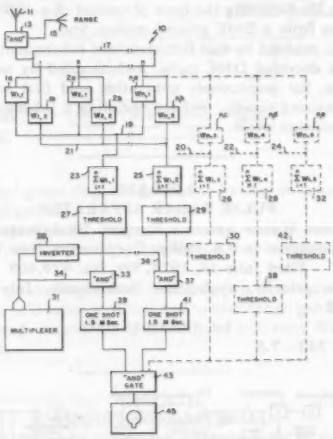
said comparator means comprising first comparator means for providing a signal output in response to detecting a voltage drop across said pair of terminals greater than both said first and said second reference voltages and second comparator means for providing a signal output in response to detecting a voltage drop across said terminals less than both said first and said second reference voltages,

each of said first comparator means and said second comparator means comprising an integrated circuit operational amplifier, said pair of terminals for a protective loop circuit within a protective zone being connected across both the positive input of one said integrated circuit operational amplifiers and the negative input of the other of said integrated circuit operational amplifiers, respectively, and said first and said second reference voltages being connected across the negative input of said one of said integrated circuit operational amplifiers and the positive input of said other of said integrated circuit operational amplifiers so that one or the other of said integrated circuit operational amplifiers will provide an output voltage signal if the voltage drop across said pair of terminals is not intermediate said first and said second reference voltages thereby to signal an alarm condition existing within said protective loop and so that an exceedingly small current is required through said protective loop and a very small voltage thereby to provide high sensitivity and safety with minimal operating expense and long battery life.

4,001,820
MULTIPLE HYPERPLANE RECOGNIZER

Erik Rosenbaum, Randallstown, and Edward G. Klimchak, Owings Mills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1971, Ser. No. 174,573
Int. Cl.² G01S 7/66
U.S. Cl. 343—5 SA **7 Claims**



1. A multiple hyperplane radar signature recognizer, comprising:

a delay line;

said delay line having a series of "N" taps spaced along its electrical length;

means connected to said taps for scaling the outputs of said taps and generating a signal when said scaled outputs are above a threshold value;

a plurality of "and" gates connected to said scaling means;

each of said "and" gates corresponds to a respective antenna polarization;

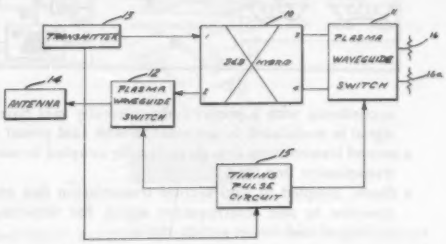
means connected to said "and" gates for enabling each said "and" gate for discrete period of time; and

means connected to the outputs of said "and" gates for indicating the presence of output signals in all of said "and" gates during each "and" gate's respective enabling period.

4,001,821
HIGH POWER MICROWAVE RADAR PULSE SHAPING SYSTEM

Theodore M. Nelson, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 16, 1975, Ser. No. 587,490
Int. Cl.² G01S 9/02; H01P 5/18; H04B 3/04
U.S. Cl. 343—5 R **2 Claims**



1. A high power microwave radar pulse shaping system comprising a 3 dB microwave hybrid having first, second, third and fourth arms, a transmitting antenna, first and second plasma waveguide switches, each having an associated grid for the pulsing thereof for predetermined firing purposes, said first plasma waveguide switch connected to both of said third and fourth arms, said second plasma waveguide switch interconnecting said second arm and said transmitting antenna, means to pulse said first and second plasma waveguide switches at predetermined times, a microwave high power RF pulse transmitter delivering to said first arm a RF pulse, said RF pulse then being split equally by said 3 dB microwave hybrid into said third and fourth arms with the split pulses being chopped by said first plasma waveguide switch, resulting reflected pulses then being combined at said second arm with the combined pulse being chopped by said second plasma waveguide switch, the output pulse at the antenna having its sharp leading edge formed by the predetermined pulsing of said first plasma waveguide switch and its sharp falling edge formed by the predetermined pulsing of said second plasma waveguide switch.

4,001,822
ELECTRONIC LICENSE PLATE FOR MOTOR VEHICLES

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,765
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 SS **11 Claims**

11. A system for communicating information between a remote station and a vehicle comprising:

means, in said remote station, for transmitting coded interrogation signals to said vehicle and for receiving coded reply signals from said vehicle; and

a unitary license tag, affixed to said vehicle, said tag including:

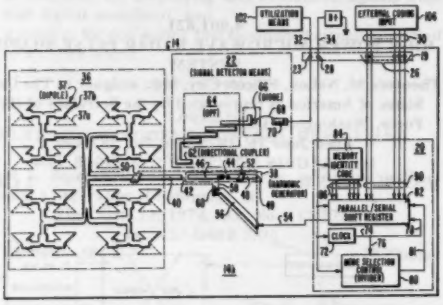
an antenna network, for receiving said interrogation signal and transmitting said reply signal,

a first transmission line coupled to said antenna network,

a non-linear device, coupled to said first transmission line and responsive to said interrogation signal and control

signals applied thereto, for generating a signal at a harmonic frequency of said interrogation signal, said harmonic signal being transmitted by said antenna network as said reply signal,

encoder means, coupled to said non-linear device, for generating said control signals to said non-linear device, in



accordance with a preset code, whereby said harmonic signal is modulated in accordance with said preset code,

a second transmission line, directionally coupled to said first transmission line, and

a diode, coupled to said second transmission line and responsive to said interrogation signal, for detecting the coding of said interrogation signal.

4,001,823

PULSE RADAR METHOD AND SYSTEM

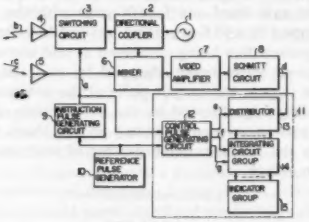
Takeshi Matsui, Kariya; Matatoyo Hinachi, Nagoya, and Masao Kotera, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 3, 1975, Ser. No. 619,474

Claims priority, application Japan, Oct. 5, 1974, 49-114855

Int. Cl.² G01S 9/06

U.S. Cl. 343—7 A **5 Claims**



2. A pulse radar system comprising transmitter means for radiating a radar pulse in a predetermined direction and repeating said radiation of radar pulse at a predetermined frequency, receiver means for obtaining a received pulse by receiving a reflected signal of said radar pulse which has encountered and reflected from a target, and detecting means operative in synchronism with the radiation of said radar pulse from said transmitting means for detecting that the time elapsed between the radiation of said radar pulse and the reception by said receiving means of said received pulse corresponding to said radar pulse corresponds to one of preset time intervals and generating a detection signal, wherein the improvement comprises:

at least one integrating circuit means connected to said detecting means for integrating said detection signals in synchronism with said predetermined frequency and generating a confirmation signal when the resulting integrated value exceeds a predetermined level and simultaneously changing the rate of decrease of said integrated value to a reduced value; and

load means connected to said integrating circuit means for receiving said confirmation signal and indicating the detection of the presence of said target within a relative distance corresponding to said preset time interval.

4,001,824

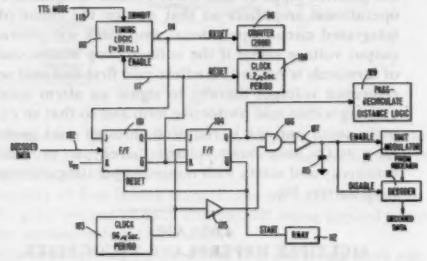
DME TIMING APPARATUS AND METHODS

John W. Bail, Fort Washington; Ronald Lee Powell, King of Prussia, and Frank Patterson Smith, 2nd, Dresher, all of Pa., assignors to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Apr. 28, 1975, Ser. No. 571,843

Int. Cl.² G01S 9/56

U.S. Cl. 343—7.3 **11 Claims**



1. In an airborne DME transceiver, timing apparatus comprising:

a source of bipolar control signals having first and second output states, said first state occurring in response to a first energizing signal, said second state occurring automatically a fixed time after receipt of a second energizing signal;

means for detecting the time of receipt of a decoded DME pulse from a DME ground station; and

means, enabled by said first state and subsequent detection of a decoded DME pulse, and disabled by said second state, for respectively generating said first and second energizing signals, and for initiating a subsequent DME transission cycle.

4,001,825

PULSE RADAR APPARATUS

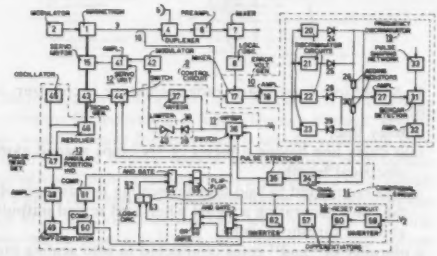
Bernhardus Walter Antonius Burgers, Haaksbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1974, Ser. No. 479,469

Claims priority, application Netherlands, July 5, 1973, 7309382

Int. Cl.² G01S 9/02

U.S. Cl. 343—7.5 **17 Claims**



1. Pulse radar apparatus comprising: a tunable transmitting

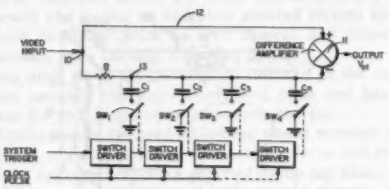
device including movable tuning member operable for changing, within a defined frequency range, a momentary transmitter frequency f_x to a desired frequency f_{xo} which is tunable in two different positions of said member; a receiver device including a local oscillator operating at a frequency f_{lo} differing from the frequency f_{xo} about a fixed frequency f_o; a servo motor the shaft of which is coupled to said tuning member; an error voltage generator including a mixer supplied with f_x and f_{lo}, respectively, to produce a signal having a frequency Δf corresponding to the difference between f_x and f_{lo}, and including frequency discriminating means connected to the output of said mixer for deriving from said signal Δf both an error voltage proportional to the frequency difference between Δf and f_o, and frequency discriminating signals indicating the operation of the transmitter device within said defined frequency range; a source of an auxiliary voltage for a coarse adjustment of said servo motor; first switching means connected for passing in one switching position, said auxiliary voltage, and in the other switching position, said error voltage to said servo motor; an angular position indicator operatively coupled to the shaft of said servo motor to generate a signal indicating momentary angular position of said shaft; and a conditional circuit controlled by said frequency discriminating signals from said error voltage generator and by said signal from said angular position indicator to produce a first control signal applied to said first switching means to change said one switching position to said other switching position to provide a fine adjustment of said servo motor by said error voltage.

4,001,826

RANGE-GATED MOVING TARGET SIGNAL PROCESSOR

James A. Moulton, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 17, 1967, Ser. No. 639,238
Int. Cl.² G01S 9/42
U.S. Cl. 343—7.7 **20 Claims**



1. A range-gated doppler processor having an input terminal and comprising

range-gated signal-averaging means responsively coupled to said input terminal for providing a time-averaged signal; and

first differential signal combining means responsively coupled to said input terminal and to said range-gated signal-averaging means for providing a non-zero frequency output.

4,001,827

CAMOUFLAGE MATERIAL

Erik W. Wallin, and Gunnar Lindquist, both of Gamleby, Sweden, assignors to Barracudaverken Aktiebolag, Djursholm, Sweden

Continuation of Ser. No. 568,424, April 16, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,310
Int. Cl.² H01Q 17/00
U.S. Cl. 343—18 A **8 Claims**

1. In a camouflage material having radar-defeating capabilities and reflectance characteristics relative to visible and near visible electromagnetic radiations suitable for camouflaging under snow conditions, the combination of

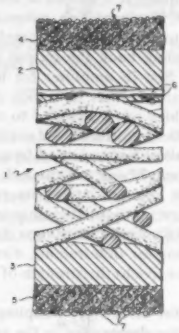
a flexible web having impedance characteristics which render the same radar-defeating;

a first flexible film covering and adhered to one surface of said web,

said first film being of a polymeric material and having at least one white pigment distributed therethrough in an amount equal to 5–50% of the total cured weight of said first film; and

a second flexible film covering and adhered to said first film,

said second film comprising a cured flexible binder heavily loaded with at least one white pigment which is highly reflective to light in the wavelength range of 3000–4000 Angstrom units,



individual particles of said at least one white pigment protruding from the exposed surface of said second film but being anchored therein,

the difference between the refractive index between said at least one pigment and said binder and the refractive index between said at least one pigment and air being such that said film reflects electromagnetic radiations within substantially the same range of wavelengths and to substantially the same extent as would said at least one pigment alone,

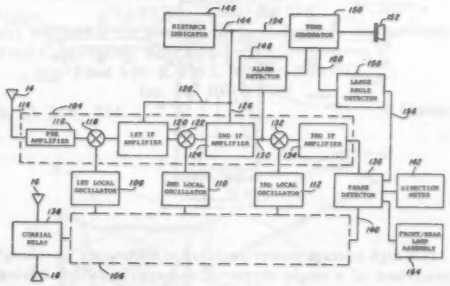
said camouflage material being adequately flexible at −40° C. to be draped in camouflaging fashion and being capable of being rolled and unrolled at −40° C. without delamination.

4,001,828

BEACON TRACKING RECEIVER

Jerry W. Culpepper, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 2, 1975, Ser. No. 563,983
Int. Cl.² G01S 5/02
U.S. Cl. 343—113 R **4 Claims**



1. A receiver for receiving R.F. signals from a subminiature transmitter and producing signals indicative of the distance and position of the transmitter relative to the receiver comprising:

a. first, second and third omnidirectional antennae posi-

tioned preselectively on a movable support to detect transmitted R.F. signals;

b. first, second and third local oscillators for producing R.F. signals at preselected frequencies;

c. first and second triple conversion channels, each channel including a preamplifier, a first mixer coupled to the outputs of the preamplifier and first local oscillator for producing IF signals at a first preselected frequency, a first IF amplifier for amplifying the IF signals, a second mixer coupled to the outputs of the first IF amplifier and second local oscillator for producing second IF signals at a preselected frequency, a second IF amplifier for amplifying the second IF signals, an automatic gain control circuit coupled to the second IF amplifier and first IF amplifier for feeding back the output of the second IF amplifier to the first IF amplifier for increasing the response of the first amplifier to a wide dynamic range of input signals, a third mixer coupled to the outputs of the second IF amplifier and third local oscillator for producing third IF signals at a preselected frequency and a third IF amplifier for amplifying the third IF signals, said first triple conversion channel having its preamplifier input coupled to the first omnidirectional antenna and its automatic gain control circuit providing a distance measuring signal for a means for determining distance to the R.F. transmitter responsive to the strength of the detected R.F. signals;

d. a relay means for selectively coupling the second and third omnidirectional antennae to the preamplifier of the second triple conversion channel; and

e. a phase detector coupled to the outputs of the third IF amplifiers of the first and second triple conversion channels for comparing the phases of the R.F. signals from the first and second omnidirectional antennae detected signals to produce signals indicative of the left/right position of the R.F. transmitter relative to the receiver, and for comparing the first and third omnidirectional antennae detected signals to produce signals indicative of the front-/rear position of the R.F. transmitter relative to the receiver.

4,001,829

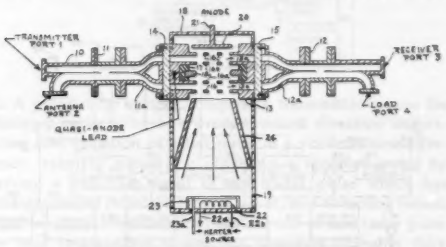
HIGH AVERAGE POWER MILLIMETER DUPLEXER

Harry Goldie, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 18, 1975, Ser. No. 606,040

Int. Cl.² H04B 1/44

U.S. Cl. 343—180 **2 Claims**



1. A high average power duplexer at millimeter wavelengths comprised of a single thyratron waveguide switch having a cathode electrode, a first anode electrode, and a grid control electrode, said grid control electrode being in the form of first and second hollow sections of first and second waveguides, respectively, said first and second waveguides being in a parallel and colinear relationship and interposed between said cathode electrode and said first anode electrode and each section having perforated sidewalls to permit the flow of electrons from said cathode electrode to said first anode electrode across said waveguide sections, said sections of waveguides being sealed into an envelope structure encompassing all of said electrodes and including first and second pressure windows closing said hollow first and second waveguides on points on either side of the perforated portions of said walls to complete said envelope, an ionizable gas in said envelope, said cathode electrode constituting an extended source of free electrons to provide a single beam, a convergence cone for increasing the density of said electrons in said waveguide sections relative to the density of said electrons at their source, said convergence cone positioned between said cathode electrode and said grid control electrode, a second anode electrode interposed between said first and second waveguides to aid in turn-on, first and second short slot hybrids forming a balanced four-port configuration, said first short slot hybrid being electrically connected to said first and second waveguides by way of said first window, and said second short slot hybrid being connected to said first and second waveguides by way of said second window, a transmitter port and an antenna port connected to said first short slot hybrid, and a receiver port and a load port connected to said second short slot hybrid.

4,001,830

RADIO RECEIVER SET WITH ROTATABLE ANTENNA

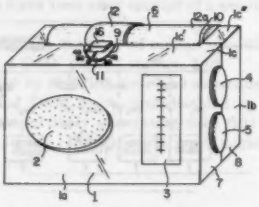
Satoshi Ishimaru, Kashiwara; Hiroshi Maeda, Sakai, and Tatsuto Mizukami, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 18, 1975, Ser. No. 605,322

Claims priority, application Japan, Aug. 20, 1974, 49-100172

Int. Cl.² H01Q 1/24

U.S. Cl. 343—702 **5 Claims**



1. A radio receiver set having a rotary antenna device comprising:

a. a cabinet having a top plate with communicating circular and elongated recesses formed therein; a printed circuit board having a radio receiver circuit thereon located within said cabinet; a hollow cylindrical rotary body positioned within said circular recess; and a first mounting member secured within said cabinet, said rotary body being pivotably mounted to said first mounting member; and

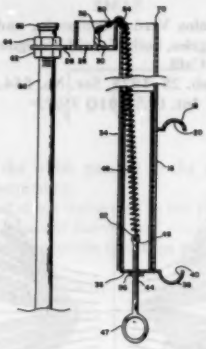
b. a hollow antenna housing case positioned within said elongated recess; a ferrite rod antenna located within said antenna housing case and electrically connected to the radio receiver circuit on said printed circuit board; a second mounting member, said antenna housing case being pivotably mounted to said rotary body by said second mounting member to permit adjustment of the elevation angle of said antenna housing case with respect to said rotary body; and a click mechanism between said antenna housing case and said rotary body for positioning said antenna housing case at a selected elevation angle, said case being held at a selected elevation angle by said click mechanism when said case is withdrawn from said elongated recess and rotated with said rotary body with respect to said first mounting member.

4,001,831

PORTABLE ANTENNA MOUNT FOR TRUCKS

Harold F. Harvey, Sand Springs, Okla., assignor to Millard F. Roberts, Tulsa, Okla., a part interest

Filed Aug. 1, 1975, Ser. No. 601,166
Int. Cl.² H01E 1/32
U.S. Cl. 343—715 6 Claims



1. Antenna attachment means for removable attachment of a radio antenna to a vehicle rearview mirror mount and comprising:

a. an elongated outer sleeve member having a first mounting hook secured thereto.

b. an elongated inner sleeve member having one end thereof slidably disposed within the outer sleeve member, the opposite end having an end plate secured thereto and a second mounting hook secured thereto and disposed oppositely from the first mounting hook.

c. a cap plate removably secured to one end of the outer sleeve opposite the inner sleeve end plate and having means for attaching the radio antenna thereto.

d. yieldable means disposed within the sleeve member one end thereof being attached to the inner sleeve end plate and the opposite end being attached to the cap plate, the yieldable means having a hook secured thereto and spaced from the cap plate, said hook being engageable with the end of the outer sleeve when the cap plate is removed from the outer sleeve against the force of the yieldable means.

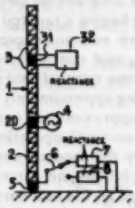
4,001,832

VERTICAL ANTENNA HAVING AN OFF-CENTER SUPPLY

René Chesneau, and Jean-Marc Martin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 2, 1975, Ser. No. 619,038
Claims priority, application France, Oct. 4, 1974, 74.33529
Int. Cl.² H01Q 9/16, 9/34
U.S. Cl. 343—747 3 Claims

1. A vertical antenna having an insulator at substantially one third of its height and a feed input comprising two terminals, said terminals being separated by said insulator, said height being substantially equal to 0.9λ, where λ is the wavelength corresponding to its operational frequency, in order to



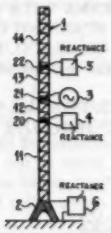
produce an inversion of the sign of the phase of the current above and under said feed input.

4,001,833

WHOLE WAVE VERTICAL ANTENNA

René Chesneau, and Jean-Marc Martin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 3, 1975, Ser. No. 619,356
Claims priority, application France, Oct. 4, 1974, 74.33528
Int. Cl.² H01Q 9/34, 9/18
U.S. Cl. 343—747 4 Claims



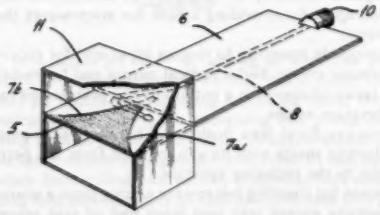
1. A whole wave vertical antenna having a feed input, comprising two terminals, above and near its middle point, and comprising first and second inductive reactances, each having two terminals, serially inserted in said antenna, respectively above and below said feed input, so as to determine, by means of an inversion of the phase of the currents on each side of said feed input, a curve of current distribution along the antenna delimiting with the axis thereof three successive regions of which the center one has a surface about one half of that of each of the other two.

4,001,834

PRINTED WIRING ANTENNA AND ARRAYS FABRICATED THEREOF

Terry M. Smith, La Honda, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Apr. 8, 1975, Ser. No. 566,607
Int. Cl.² H01Q 9/28
U.S. Cl. 343—754 9 Claims



1. A printed wiring antenna comprising:

at least one insulating substrate sheet having conductors bonded to both faces thereof,

a first conductor on a first face of said substrate having a relatively large area almost covering said first face, said first conductor having a tapered notch therein, said notch having a narrow end and increasing divergence toward the other end, said notch extending to have maximum divergence at one edge of said substrate, said maximum divergence being approximately equal to the width of said substrate and approximately equal to one electrial wavelength at the nominal operating frequency of said antenna, whereby the tapered conductors defined by said notch produce broadband antenna action when electrical energy is applied across said narrow portion of said notch,

a second conductor on a second face of said substrate contoured to act as a microstrip transmission line, said second conductor extending over said substrate opposite said first conductor which acts as a ground plane thereto to provide microstrip transmission line action,

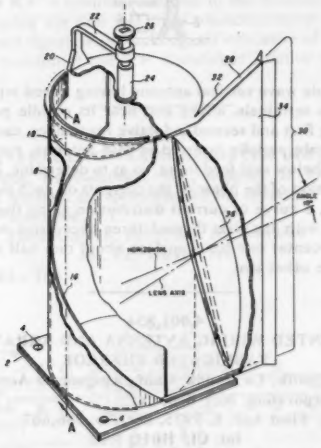
means coupled through said substrate for electrically connecting said line to said first conductor at a point located along said notch and

means for applying radio frequency energy between said second conductor and said first conductor.

4,001,835
SCANNING ANTENNA WITH EXTENDED OFF BROADSIDE SCANNING CAPABILITY

R. Thomas Dover, and Christian O. Hemmi, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 12, 1975, Ser. No. 576,919
Int. Cl.[2] H01Q 3/18, 19/06
U.S. Cl. 343—754 8 Claims



1. A wide angle microwave scanning antenna comprising:

a waveguide assembly of two parallel conductive sheets spaced apart for providing a path for microwaves therebetween,

said waveguide assembly having an input end for receiving microwave energy and a vertical output end for radiating said received energy in a pattern over a preselected range of elevation angles,

a microwave focal lens positioned between said parallel conductive sheets with its axis inclined from the perpendicular to the radiating aperture.

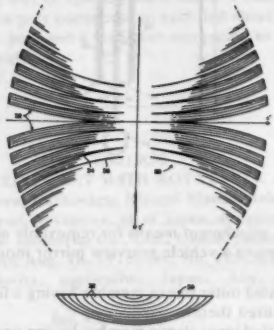
feed means for coupling microwave energy from a source of microwave energy into said input end of said assembly including a movable feed element positioned substantially in the focal path of said focal lens throughout a preselected range of movement, the location of said feed element controlling the elevation angle of said radiated energy, and

means coupled to said feed element for moving said element in said focal path.

4,001,836
PARABOLIC DISH AND METHOD OF CONSTRUCTING SAME

John S. Archer, Palos Verdes Peninsula, and Harry J. McCracken, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 28, 1975, Ser. No. 554,038
Int. Cl.[2] H01Q 19/12
U.S. Cl. 343—756 7 Claims



1. The method of constructing a parabolic dish of focal length F and comprising narrow segments disposed side by side whose projection onto a plane normal to the principle axis of the dish and containing x and y coordinate axes intersecting at an origin on the principle axis is a plane figure divided into narrow increments parallel to the x-axis and spaced along the y-axis and each having a side adjacent and parallel to the x-axis which intersects the y-axis at an axis intersection point and terminates in end points on the perimeter of the figure, said method comprising the steps of:

forming from relatively thin flexible sheet material an assembly of curved strips corresponding to said increments, respectively, and arranged side by side in the same order as said increments and each strip having a convex edge and an opposite concave edge, the convex edge of each strip conforming to a curve passing through said axis intersection point of said adjacent side of the corresponding increment and defined by the locus of points expressed by the parametric equations:

$$x = x_o + \frac{1/24F^3}{\left[1+\left(\frac{y_o}{2F}\right)^2\right]} x_o^3 - \frac{1/640F^5}{\left[1+\left(\frac{y_o}{2F}\right)^2\right]^2} x_o^5 + \ldots$$

$$y = \frac{y_o/8F^2}{\left[1+\left(\frac{y_o}{2F}\right)^2\right]} \cdot x_o^2$$

where: x_n is any x coordinate value between and including the x coordinates of the end points of the adjacent side of the corresponding increment,

y_o is the y coordinate of the axis intersection point of the adjacent side of the corresponding increment,

and the spacing w between said convex and concave edges of each strip parallel to said y-axis is uniform and equal to

$$w = \sqrt{1 + \left(\frac{y_o}{2F}\right)^2}\, w'$$

where: w' is the width parallel to the y-axis of the corresponding increment;

deforming said strips transverse to the plane of the strips to bring their adjacent convex and concave edges into contiguous relation wherein the strips conform to a parabolic curvature; and

joining the contiguous strip edges.

4,001,837

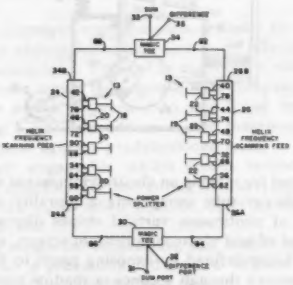
DUAL SCAN CORNER REFLECTOR ANTENNA

Kenneth M. Regenos, Palo Alto, and Normand Barbano, Sunnyvale, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1976, Ser. No. 647,694

Int. Cl.² H01Q 3/26, 19/16

U.S. Cl. 343—815 **4 Claims**



1. A dual scan corner reflector antenna beam forming network comprising: first and second planar microwave reflector surfaces disposed for forming a throat at an acute angle therebetween, a plurality of dipole antennas uniformly disposed in said throat for radiating and receiving microwave energy, a first helix frequency scanning feed coupled to a first portion of said dipole antennas for coupling microwave energy thereto, a second helix frequency scanning feed coupled to a second portion of said dipole antennas for coupling microwave energy thereto, first and second hybrid junctions coupled to both of said helix feeds for coupling microwave energy to and from respective ends of said feeds for providing simultaneous and independent radiation scanning operation of said antenna.

4,001,838

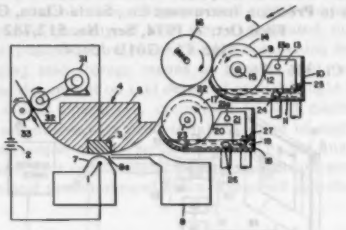
METHODS AND APPARATUS FOR CLEANING PAPER IN A HIGH SPEED ELECTROSTATIC PRINTING APPARATUS

Ronnie Joseph Maddox, San Jose, Calif., assignor to Electroprint, Inc., Cupertino, Calif.

Filed Apr. 1, 1974, Ser. No. 456,508

Int. Cl.² G03G 21/00

U.S. Cl. 346—153 **46 Claims**



1. Apparatus for controlling unwanted loose or easily lossened particulate matter on paper comprising:

means for edgewise transporting the paper along a path;

roller means positioned to engage one surface of the paper during transport along the path, said roller mounted for rotation such that its surface velocity substantially matches that of the paper at their respective points of engagment; and

means for wetting the paper-engaging surface of said roller means with a thin film of liquid to wet the paper tending to cause a portion of the particulate matter to be held on the paper surface and to cause another portion of the particulate matter to be removed from the paper surface by adhering to said roller means.

4,001,839

LIQUID JET RECORDER

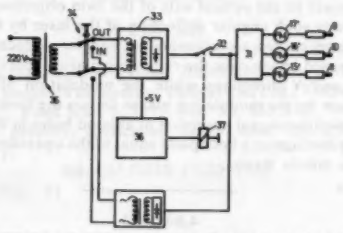
Helmut Kraus, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 30, 1974, Ser. No. 511,031

Claims priority, application Germany, Oct. 2, 1973, 2349459

Int. Cl.² G01D 15/18; B41J 3/04

U.S. Cl. 346—75 **6 Claims**



1. In a liquid jet recorder having at least one jet nozzle directed towards a recording carrier; and a pump connected to said jet nozzle for supplying recording liquid thereto; an electrical power supply for energizing said pump during recording periods of said recorder, the improvement comprising: a timer switch arrangement connected to said pump; and a switch having first and second positions, said switch connecting said power supply to said pump in said first position, said switch connecting said power supply to said timer switch arrangement in said second position, said timer arrangement being adapted to actuate said pump for short periods of time

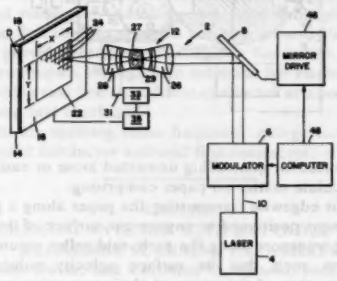
when said recorder is in a non-recording state whereby recording liquid is pumped to said nozzle during non-recording intervals to avoid nozzle clogging.

4,001,840

NON-PHOTOGRAPHIC, DIGITAL LASER IMAGE RECORDING

Carl H. Becker, Menlo Park; Herman Wong, Los Altos Hills, and William J. Kaspari, Portola Valley, all of Calif., assignors to Precision Instrument Co., Santa Clara, Calif.

Filed Oct. 7, 1974, Ser. No. 512,782
Int. Cl.² G01D *15/14*
U.S. Cl. 346—76 L **4 Claims**



1. A real time, flat-field laser recording system employing an ablatable recording medium carried on a flat substrate comprising:

holding means for positioning the recording medium flat in a recording plane;

a diffraction limited twin objective having first and second spaced-apart, aligned lens means for focusing a laser beam in a diffraction limited spot in the focal plane of the first lens means and for projecting a diffraction limited, focused image of the spot in the recording plane irrespective of the relative angular inclination of the incoming beam relative to the twin objective;

means between the lens means of the twin objective filling the optical path between the lens means with a material having an index of refraction substantially equal to the index of refraction of the lens means;

a laser for emitting a laser beam;

means for modulating the laser beam; and

mirror means for angularly deflecting the laser beam with respect to the optical axis of the twin objective;

whereby such angular deflection of the laser by the mirror means causes a corresponding angular deflection of the focused image over the recording plane in corresponding X and Y directions while the modulation of the laser beam by the modulating means causes the formation of a two-dimensional ensemble of ablated holes in the recording medium at a line speed equal to the operating speed of the mirror means.

4,001,841

RECORDING HEAD ARRAY WITH PASSIVE POLE

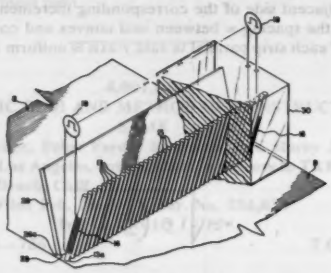
Ami E. Berkowitz, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,595
Int. Cl.² G03G *19/00*; **G11B** *5/27*
U.S. Cl. 346—74.1 **11 Claims**

1. A magnetic recording head array comprising:

a flat sheet of magnetic material having a straight edge defining a first pole;

a compound second pole comprising a plurality of cores comprising straight pins of magnetic material, one end of each of said pins defining a pin pole, said pins being disposed in a plane forming an acute angle with said sheet and further being, at all points, separated from said sheet to define a gap therebetween, the permeability of said gap being substantially less than the permeability of said



magnetic materials, said ends of said pins being further disposed on a straight line lying parallel to said edge of said sheet in a recording plane; and

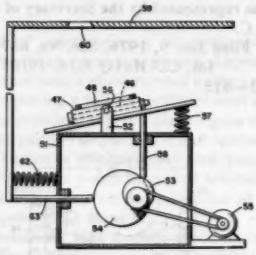
a plurality of conductive windings wrapped on said cores.

4,001,842

APPARATUS FOR MAKING ELECTRO-LUMINESCENT SCREENS FOR COLOR CATHODE-RAY TUBES OF CONTINUOUS PHOSPHOR STRIPES

Takeshi Suzuki; Hiroshi Tanaka, both of Fukaya, and Masanori Akiyama, Honja, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 386,317, Aug. 7, 1973, Pat. No. 3,890,151.
This application May 5, 1975, Ser. No. 574,639
Claims priority, application Japan, Aug. 7, 1973, 48-78420
Int. Cl.² G03B *41/00*
U.S. Cl. 354—1 **10 Claims**



1. Apparatus for making an electroluminescent screen for a color cathode-ray tube comprising a plurality of separate color fields of continuous vertical stripes disposed on the viewing panel of said electroluminescent screen, each of said color fields being defined by exposing panel to light from a linear light source through a concave shadow mask attached to said panel, said shadow mask having a number of beam-passable apertures arranged in rows parallel with each other, the light projected from said light source through said mask apertures onto said panel producing a developable image on said panel, the apertures along the length of each of said rows being separated from each other by beam-intercepting bridge portions, comprising:

a. means for locating said light source at a predetermined position on the opposite side of said shadow mask for irradiating said shadow mask and projecting light from said source on an area of said panel in a pattern comprising images defined by the apertures of said shadow mask, said light source having a sufficient effective length in the lengthwise direction of the rows of the apertures to produce on said panel an image of each aperture so ex-

panded in the lengthwise direction of the rows of the apertures as to overlap the image of each adjacent aperture in the lengthwise direction of each of the rows;

b. means for limiting the irradiated area on the shadow mask to a length covering a portion of the length of the rows of the apertures, the apertures within said lighted area having a nearly equal angle of inclination with respect to the vertical axis of said screen;

c. means cooperating with said limiting means for moving said irradiated area on the shadow mask along the length of the rows of the apertures; and,

d. means for controlling the inclination of said light source to keep the longitudinal axis thereof substantially parallel to a line drawn tangent to the shadow mask apertures in the irradiated area.

4,001,843
PHOTOGRAPHIC CONTROL SYSTEM WITH EVALUATION CONTROL

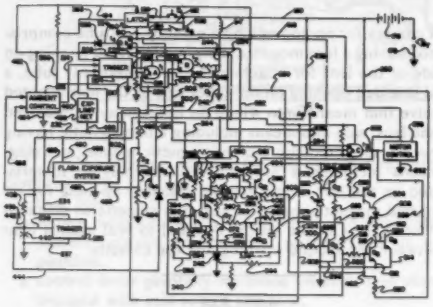
Seymour Ellin, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 424,556, Dec. 13, 1973. This application July 29, 1974, Ser. No. 492,774

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² G03B *7/00*

U.S. Cl. 354—23 D **38 Claims**



1. In an exposure control system actuable to automatically carry out a photographic exposure cycle effecting the exposure of photographic material in accordance with the brightness level of a scene, the improvement comprising:

detector means responsive to said scene brightness and having a signal condition in the presence of levels of brightness below a predetermined level;

selectively engageable inhibit means responsive to said signal condition for preventing the carrying out of a said exposure cycle when enabled upon actuation of said system; and

override means for suppressing said inhibit means enablement for a predetermined interval of time following an initial said actuation of said system.

4,001,844
EXPOSURE CONTROL SYSTEM

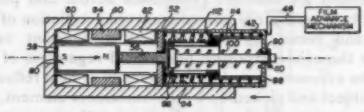
Richard D. McClintock, Washington Road, Woodbury, Conn. 06798

Filed Aug. 12, 1974, Ser. No. 496,765

Int. Cl.² G03B *7/08, 9/62*

U.S. Cl. 354—51 **26 Claims**

1. A system for controlling the closing of a photographic camera shutter in response to initiation of shutter closure comprising exposure control means for detecting the available light level in the photographic field of view of the camera and providing an output control signal a predetermined time after said shutter closure initiation dependent on said detected available light level, power supply means operatively connected to said exposure control means for providing power to said exposure control means, said power supply means comprising magnetic generator means comprising an electric coil means and a magnetic means mechanically movable with respect to said coil means for providing an output signal for powering said exposure control means in response to said relative mechanical movement of said magnetic means with respect to said coil means, and storage means for storing said generated output signal until discharge of said storage means, said exposure control means output control signal comprising a predetermined quantity of said stored generated output signal, said exposure control means further comprising means for discharging said storage means to provide said output control signal dependent on said detected available light level and gating means operatively connected to said discharge means and responsive to a predetermined value of said discharge means output control signal for providing the quantity of stored generated output signal remaining on said storage means when said predetermined value is reached as a shutter



closure signal, and solenoid means comprising a solenoid coil operatively connected between said gating means output and said camera shutter for holding said shutter open after said shutter closure initiation until said solenoid coil is energized, said solenoid coil being operatively connected to said exposure control means gating means output for receiving said shutter closure signal from said exposure control means gating means output, said shutter being responsive to said received shutter closure signal to cause said camera shutter to close as a result thereof, whereby power drain in said system is minimized until the camera shutter is closed, and said camera includes a film advance means for providing the film in the appropriate position for taking a photograph prior to said shutter closure initiation, said film advance means being operatively positioned adjacent said mechanically movable camera means for mechanically moving said means to fire said generator simultaneously with said film advance for providing a first stroke of said generator for providing said generator output signal for charging said storage means as a result of said film advance.

4,001,845
ELECTRICAL SHUTTER CIRCUIT FOR CAMERA

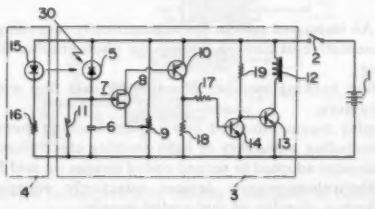
Yoshihisa Maitani, and Akihiko Hashimoto, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1975, Ser. No. 555,373

Claims priority, application Japan, Mar. 22, 1974, 49-32700[U]

Int. Cl.² G03B *17/20, 7/08*

U.S. Cl. 354—51 **4 Claims**



1. For use in preventing the premature exhaustion of a

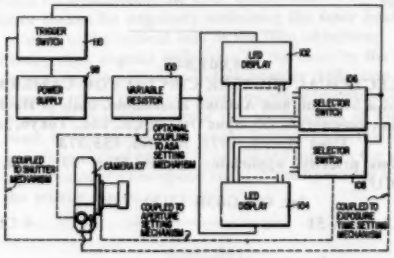
battery in a camera, an electrical circuit assembly for the camera comprising a shutter assembly and a control circuit therefor which is responsive to a shutter opening operation for automatically controlling the closing of the shutter assembly, the shutter control circuit including a photoelectric transducer element responsive to light reflected from an object being photographed for generating an output which aids in determining a proper exposure period in accordance with the brightness of the reflected light, integrating means connected in electrical series with said transducer element and responsive to the output of said element for developing a signal increasing toward an output level at a rate controlled by the magnitude of said transducer element output; means responsive to the presence of said output level for closing said shutter assembly; and a photo-bias circuit having a light emitting element for irradiating the photoelectric transducer element with light of a given intensity; a battery type portable power source, switch means for simultaneously energizing the light emitting element and the transducer element from the power source when the shutter opening operation is initiated, said photo-bias circuit element being connected in series with a resistor element for selective connection across said power source and being energized immediately upon initiation of the exposure and remaining energized at a constant value throughout the entire exposure period and regardless of the length of the exposure period or the intensity of light reflected from the subject and picked up by the transducer element, the value of the resistance element maintaining the intensity of illumination constant to controlling the shutter control circuit to close the shutter assembly at a given period of time after a shutter opening operation which given period is greater than a maximum designated period for a normal photographing operation, in the event that light reflected from an object being photographed which is incident on the photoelectric transducer element, while the shutter assembly is open, is very weak or absent, so as to enable the shutter assembly to remain open at least long enough to permit the occurrence of a normal photographing operation.

4,001,846

RECORDING SYSTEM FOR PHOTOGRAPHIC CAMERAS

John J. Kauneckas, 2301 E Street, NW., Washington, D.C. 20037

Filed Aug. 9, 1974, Ser. No. 496,314
Int. Cl.² G03B *17/24*
U.S. Cl. 354—105 **13 Claims**



1. An improved system for automatically recording images representative of camera settings on photographic film comprising:

a film backing member of engaging said film within said camera,

display means mounted in said film backing member and including a plurality of light emitting electroluminescent devices adapted to record coded images on said film, said electroluminescent devices selectively energizable to form a plurality of said coded images;

light diffusing means including reflecting chambers formed in said film backing member associated with said light emitting electroluminescent devices for diffusing light emanating therefrom,

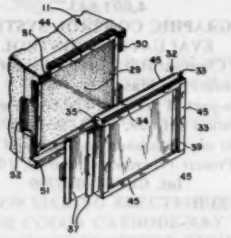
multiple position selector means designed to be coupled to said camera for movement with camera setting mechanisms for identifying selected settings thereof, said selector switch coupled to said display means for varying said coded images.

4,001,847

OSCILLOSCOPE CAMERA

Neal McGrath, Alexandria, Va., assignor to Illinois Nuclear Electronics, Inc., Addison, Ill.

Filed Sept. 2, 1975, Ser. No. 609,444
Int. Cl.² G03B *19/10*
U.S. Cl. 354—174 **8 Claims**



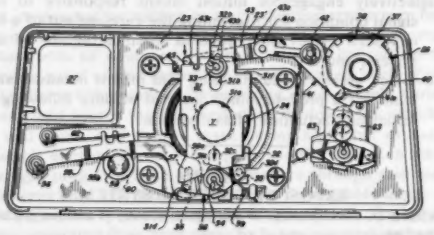
1. A camera for photographing a cathode-ray tube comprising a box having a lens mounted therein, a shielded opening on one side of the lens for attachment to a cathode-ray tube, a second shielded opening on the other side of the lens adapted to receive film means onto which an image may be received from the lens, said film means including a film cassette having peripherally mounted continuous magnetic means, and magnet means including a strip of resilient magnet material mounted on the box at said second shielded opening for receiving said magnetic means of said film cassette to magnetically mount the cassette on the box and to seal against light loss between the second opening and the cassette.

4,001,848

CAMERA CONSTRUCTION

Israel Nesson, Brighton, Mass.; Edwin E. Faris, Wyckoff, and Robert G. Palmer, Wayne, both of N.J., assignors to Berkey Photo, Inc., Paramus, N.J.

Filed June 12, 1975, Ser. No. 586,257
Int. Cl.² G03B *3/00, 13/02*
U.S. Cl. 354—196 **7 Claims**



1. In a camera construction having a pair of iris blades mounted for simultaneous relative movement in opposite directions to define an iris opening of selected configuration, and control means for effecting movement of the iris blades; said control means comprising a manually adjustable first unit for effecting movement of the iris blades in response to the adjustment of said first unit, a second unit spaced from said first unit and manually adjustable independently thereof for

effecting movement of the iris blades in response to the adjustment of said second unit, and a movable member common to said first and second units and independently movable thereby for imparting motion to the iris blades; said movable member including a link assembly having a lever adapted to engage one of the iris blades and effect movement thereof, said lever being mounted for pivotal movement about a plurality of selected pivotal axes, the pivotal axis selected for said lever being dependent upon which of said units is manually adjusted.

4,001,849

PHOTOGRAPHIC CAMERA FOR USE WITH FILM CARTRIDGE

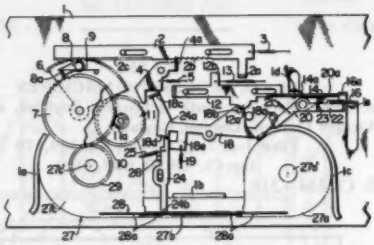
Tamotsu Takahashi, Tokyo, Japan, assignor to Copal Company Limited, Toyko, Japan

Filed Apr. 9, 1975, Ser. No. 566,430

Claims priority, application Japan, Apr. 11, 1974, 49-41689

Int. Cl.² G03B *17/42*

U.S. Cl. 354—207 **3 Claims**



1. A photographic camera for the use of film cartridges comprising:

a base plate,

a setting member slidably mounted on said base plate and moved between its uncocked position and its cocked position,

a control lever pivotally mounted on said base plate and engaged with said setting member,

a sensing lever slidably and rotatably mounted on said base plate and engaged with said control lever,

a film cartridge capable of being mounted on said base plate and containing a film having perforations engageable with said sensing lever,

a lock member rotatably mounted on said base plate and operatively connected with said control lever, and

a release member movably mounted on said base plate and engageable with said lock member,

said release member being disposed and constructed for movement to return said setting member from its cocked position to its uncocked position only when said sensing lever engages with one of said perforations of said film, and

said sensing lever being disposed and constructed for disengagement from one of said perforations by said control lever when said setting member returns to its uncocked position from its cocked position.

4,001,850

DATA RECORDING CAMERA

Susumu Fujita, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 20, 1975, Ser. No. 624,020

Claims priority, application Japan, Oct. 25, 1974, 49-123813

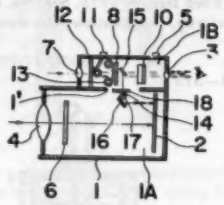
Int. Cl.² G03B *17/24, 13/02*

U.S. Cl. 354—219 **3 Claims**

1. In a camera comprising a film exposure system which includes an object lens system for focussing of image-wise light onto photosensitive film material provided in said camera and shutter means selectively movable to positions to permit or to prevent passage of said image-wise light onto said film material, a viewfinder system which is provided independently of said film exposure system and includes an eyelens permitting viewing of an object from which image-wise light may be directed by said object lens system onto said film material, and camera wall portions defining a film exposure system compartment and a viewfinder system compartment, the improvement comprising:

externally adjustable data specification means to selectively present different items of data,

first optical means for directing said image-wise light carrying said data content to said eyelens, whereby said data content is viewable in said viewfinder system,



second optical means for directing said image-wise light carrying said data content onto a portion of said film material, whereby said data content may be recorded on said film material, and

gate means operatively coupled to said shutter system and movable to closed position and open position, said gate means being closed to prevent passage by said second optical means of said image-wise light onto said film material when said shutter means is closed, and being opened to permit passage of image-wise light onto said film material by said second optical means when said shutter means is opened, whereby content of said data specification means may be selectively recorded on said film material.

4,001,851

GAS PRESSURE DEVICE FOR DRIVING OPERATING MEANS IN A CAMERA

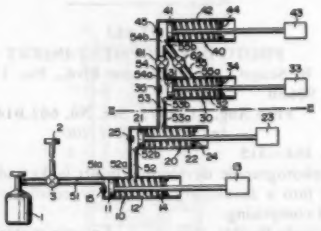
Toshihiro Kondo, Tokyo, Japan, assignor to Toshihiro Kondo, Tokyo and Fuji Photo Film Co., Ltd., both of, Japan

Filed Oct. 16, 1975, Ser. No. 622,853

Claims priority, application Japan, Oct. 16, 1974, 49-119047; Oct. 16, 1974, 49-119046

Int. Cl.² G03B *17/00*

U.S. Cl. 354—266 **20 Claims**



1. A device for sequentially driving a plurality of operating means in a camera comprising a plurality of operating members connected with operating means in a camera for actuating the same, a plurality of pressure conversion means each

including a movable member which convert gas pressure to a movement of the movable member, each said operating member being connected with a movable member so that the operating members are actuated by the pressure of the gas supplied to said pressure conversion means, a gas supply means for supplying a gas to said pressure conversion means, and a flow control means provided between the gas supply means and at least one of said pressure conversion means for controlling the rate of flow of the gas flowing into the pressure conversion means.

4,001,852

ROTATING AUGER ARRANGEMENT FOR PUMPING PROCESSING FLUID THROUGH A FILM DEVELOPING CONTAINER

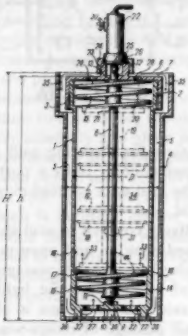
Kurt Gall, Wellenstr. 22, Suttgart-Birkach, Germany (7000)

Filed Dec. 9, 1975, Ser. No. 639,213

Claims priority, application Germany, Dec. 10, 1974, 2458276

Int. Cl.² G03D *17/00*

U.S. Cl. 354—313 **12 Claims**



1. An apparatus for developing photographic film, said apparatus comprising:

an outer vessel for holding a bath of film-treatment liquid;

a container receivable within said vessel and having a base and a removable cap each formed with at least one throughgoing hole for passage through said container of said liquid;

means in said container for holding said film between said base and said cap;

a rotatable shaft extending in said container from said base to said cap;

an auger secured to said shaft adjacent said base and having a pitch greater than 45°, whereby rotation of said shaft and auger displaces said liquid in said container; and

means for preventing light from entering said container through said holes and falling on said film.

4,001,853

PHOTO DEVELOPMENT INSERT

William B. Seagel, 16123 Pioneer Blvd., No. 15, Norwalk, Calif. 90650

Filed Aug. 11, 1975, Ser. No. 601,014

Int. Cl.² G03D *17/00*

U.S. Cl. 354—315 **3 Claims**

1. A photographic developing insert jacket adapted to be inserted into a developing tank for processing photographic material comprising:

a relatively flexible, thin sheet of plastic material;

a pair of oppositely disposed leading edges formed as a first retaining means wherein prints or films are positioned therebetween;

wherein each of said first retaining means comprises a heat-treated crease line formed longitudinally adjacent to each of said leading edges, thereby forming a longitudinal lip member, said lip member being folded inwardly of said sheet, whereby said films or prints are inserted and retained therein; and

a second retaining means centrally positioned between said first retaining means and arranged in parallel relation thereto.

4,001,854

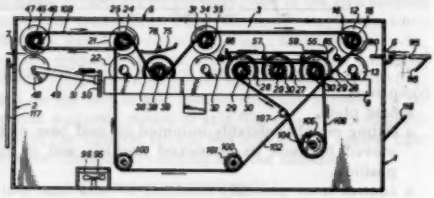
PLATE PROCESSING MACHINES

Alec James Formoy, South Ockenden, England, assignor to Vickers Limited, London, England

Filed Jan. 7, 1975, Ser. No. 539,170

Int. Cl.² G03D *3/08, 5/00*

U.S. Cl. 354—318 **10 Claims**



1. A machine for processing a lithographic printing plate carrying an image-wise exposed layer of light sensitive material, which machine comprises a support and, mounted on the support,

a. means for moving the plate with said layer face downwards along a straight path through the machine,

b. a first reservoir mounted beneath the path for containing developer,

c. a plurality of rotatably mounted processing rollers extending transversely of the path in brushing relationship with said layer and disposed within said first reservoir,

d. means for rotating all of the processing rollers in the same direction as that in which the plate moves and at a speed greater than the speed at which the plate is moved through the apparatus so that all of the processing rollers exert a brushing action on said layer in the same direction as that in which the plate moves along the straight path,

e. a flat plate member located above and extending transversely of the path to urge said layer of the plate against the processing rollers so that the processing rollers apply developer from the reservoir to said layer and agitate the developer in contact with said layer to develop the same, means for adjusting said plate member with respect to the support so that the distance between said plate member and the processing rollers may be adjusted to vary the pressure applied by the plate member to the plate as it moves along the path,

f. means located adjacent the path for removing developer from said layer,

g. a second reservoir for containing a desensitizing solution

and mounted beneath the path downstream of the first reservoir,

h. a rotatably mounted desensitizing roller extending transversely of the path and disposed within said second reservoir beneath said path in brushing relationship with respect to the developed layer of the plate as the plate moves along the path,

i. means for rotating the desensitizing roller,

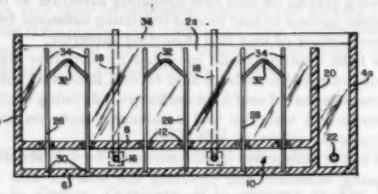
j. means for urging the developed layer of the plate against the desensitizing roller so that the desensitizing roller applies desensitizing solution from the second reservoir to the developed layer, and

k. means located adjacent to the path for drying the desensitized developed layer of the plate as the plate moves along the path.

4,001,855
RAPID-FLOW WASHER FOR PHOTOGRAPHIC SHEET MATERIAL

Henry Gilmer Wilhelm, 723 State St., Grianell, Iowa 50112

Filed Mar. 10, 1975, Ser. No. 556,919
Int. Cl.² G03D *3/02*
U.S. Cl. 354—324 **6 Claims**



1.

a. A washer for washing photographic material in sheet form comprising

b. a tank having a pair of rectangular parallel vertical side walls and end walls, and a horizontal bottom wall and open at the top,

c. a horizontal septum within said tank parallel to and spaced from the bottom wall to provide between itself and said bottom wall a single fluid distribution manifold, said septum being perforated with a large number of spaced small perforations for the passage of water,

d. a fluid supply means for supplying to said manifold a continuous stream of water under pressure sufficient for said stream to rise through said perforations to fill the tank,

e. a vertical septum near one of said end walls and parallel thereto, in water-tight edge contact with the two side walls and the bottom wall, the top edge of said vertical septum being below the top edges of the tank so that water rising in the tank flows over the top of said vertical septum and into the space between said vertical septum and its adjacent end wall without spilling over the top of the tank;

f. a fluid outlet nozzle near the bottom of said vertical space for continuous removal of said overflow water from from the tank when the tank is supplied with said continuous stream of water;

g. said horizontal septum being provided with a number of spaced parallel rows of wire receiving apertures;

h. a number of sheet separating elements each shaped like an inverted U, made of stiff wire of a thickness so that the end of the U can fit freely but snugly into said wire receiving apertures;

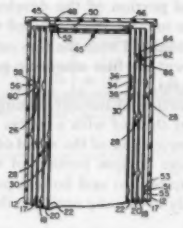
i. said sheet separating elements being fitted into at least some of said apertures to form at least two parallel rows of said separating elements spaced sufficiently to support between them a sheet of photographic material such as a photo print on edge for washing;

j. said small perforations being located immediately adjacent said apertures and in line with a row of the U-shaped elements.

4,001,856
PHOTOGRAPHIC PROCESSING APPARATUS

Paul B. Stimson, Neck Road R.F.D. No. 4, Old Lyme, Conn. 06371

Filed Apr. 4, 1975, Ser. No. 564,995
Int. Cl.² G03D *13/02*
U.S. Cl. 354—331 **10 Claims**



1. A photographic processing apparatus comprising:

a. a tank having an internal cylindrical cavity for holding a solution;

b. at least first reel means and second reel means, each of said first and second reel means being a cylindrical member having open ends, said first reel means coaxially mountable within said internal cylindrical cavity, said second reel means coaxially mountable within said first reel means, said first reel means includes track means that defines a film guide and a film spacer, said second reel means including track means that defines a film guide and a film spacer;

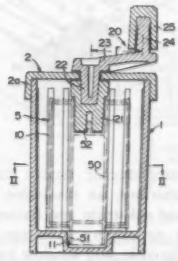
c. a cap mounted to each open end of said second reel means for sealing said second reel means; and

d. means for sealing said tank, said first reel means and said sealed second reel means totally contained and sealed within said sealed tank.

4,001,857
DEVELOPING DEVICE

Masai Ikechi, and Kuniyuki Kusano, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 3, 1975, Ser. No. 546,764
Claims priority, application Japan, Feb. 4, 1974, 49-14586[U]
Int. Cl.² G03D *13/02*
U.S. Cl. 354—337 **13 Claims**



1. A developing device for developing a photographic film for still cameras, said device comprising

a film magazine containing a film wind-back spool on which the film is wound, said film magazine having a film outlet

adapted for the passage of the film therethrough and said spool having an end portion which projects downwardly from said magazine,

a developing tank body having a cylindrical portion with an open upper end and a bottom portion to receive a developer liquid and the film magazine therein, and

a handle which has an engaging portion which releaseably engages said spool, said handle also having an arm portion radially extending outward from said engaging portion to be rotated by the hand so that said spool can be rotated back and forth and thereby effect development of said film by the developer liquid which passes into said magazine,

said cylindrical portion of the developing tank being provided on the inner surface thereof with a surface irregularity to be engaged with the film outlet of the film magazine to prevent the film magazine put therein from being rotated therein,

said bottom portion of the developing tank being provided at the center thereof with a recess to receive the downwardly projected end of the spool of the film magazine so that the entire bottom portion of said magazine is substantially adjacent to said bottom portion of the developing tank body to thereby optimize the usage of said developer liquid.

4,001,858

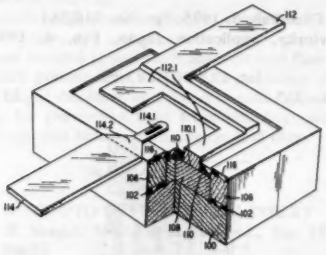
SIMULTANEOUS MOLECULAR BEAM DEPOSITION OF MONOCRYSTALLINE AND POLYCRYSTALLINE III(A)-V(A) COMPOUNDS TO PRODUCE SEMICONDUCTOR DEVICES

William Charles Ballamy, Reading, Pa., and Alfred Yi Cho, New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 501,154, Aug. 28, 1974, Pat. No. 3,928,092. This application Aug. 29, 1975, Ser. No. 609,162

Int. Cl.² H01L *29/92, 29/48, 29/56, 27/02*

U.S. Cl. 357—14 **12 Claims**



1. A GaAs semiconductor device comprising: a semi-insulating GaAs substrate; an insulative layer formed on a major surface of said substrate and having a window therein which exposes the underlying substrate; a monocrystalline GaAs first layer formed in said window and on said substrate; a monocrystalline GaAs second layer formed on said first layer; at least one high resistivity polycrystalline GaAs layer formed on said insulative layer so as to surround said first and second monocrystalline layers; a first electrical contact to said first layer; and a second electrical contact to said second layer.

4,001,859

PHOTO COUPLER

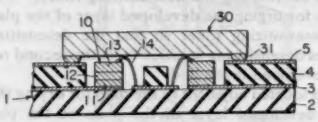
Tadahiko Miyoshi, Hitachi, and Yasutoshi Kurihara, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1976, Ser. No. 652,307

Claims priority, application Japan, Jan. 24, 1975, 50-9758

Int. Cl.² H01L *31/12*

U.S. Cl. 357—19 **16 Claims**



1. A photo coupler comprising:

a. a first insulating substrate provided with a first conductive layer having a predetermined pattern on one surface thereof;

b. a second insulating substrate provided with a second conductive layer having a predetermined pattern on one surface thereof and a hole penetrating therethrough at a predetermined portion, said second insulating substrate being placed on said first insulating substrate so that the other surface of said second insulating substrate faces the one surface of siad first insulating substrate;

c. a light emitting diode mounted on said first insulating substrate in the hole of said second insulating substrate, one terminal of said light emitting diode being electrically connected with the first conductive layer on said first insulating substrate; and

d. a photo responsive device mounted on said second insulating substrate and covering the hole of said second insulating substrate so that the light sensitive surface of said photo responsive device faces said light emitting diode.

4,001,860

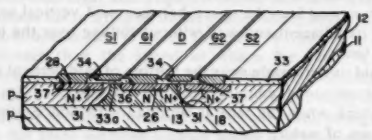
DOUBLE DIFFUSED METAL OXIDE SEMICONDUCTOR STRUCTURE WITH ISOLATED SOURCE AND DRAIN AND METHOD

Thomas P. Cauge, Mountain View, and Joseph Kocsis, Sunnyvale, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 415,110, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 274,442, July 24, 1972, abandoned, which is a continuation of Ser. No. 89,248, Nov. 13, 1970, abandoned. This application Aug. 4, 1975, Ser. No. 601,355

Int. Cl.² H01L *29/78*

U.S. Cl. 357—23 **3 Claims**



1. In a metal insulator semiconductor structure, a semiconductor body of one conductivity type, an epitaxially grown layer of semiconductor material of uniform thickness ranging from 1–3 microns carried by the semiconductor body and being of opposite conductivity type so that there is a first PN junction between said body and said layer, said layer having a substantially planar surface, a layer of insulating material disposed on said surface, a first diffused region of said one conductivity type formed in and extending through said layer of semiconductor material and being defined by a second PN

junction which extends from said surface through said layer of semiconductor material and down to said semiconductor body, said first region surrounding a portion of said layer to define a predetermined region and in such a manner so that said predetermined region gradually increases in width in cross-section as the predetermined region increases in depth and so that the bottom of the predetermined region is defined by said first PN junction and the sides are defined by said second PN junction, said predetermined region underlying a predetermined closed area on said surface, a second region of opposite conductivity type formed in said first region to a depth substantially less than the depth of the first region and being defined by a third PN junction which extends to the surface, said second region being in close proximity to the outer margin of the closed area and extending laterally in a direction away from the predetermined region, said second and third PN junctions serving to define a channel to precise length underlying said predetermined closed area, a third region of opposite conductivity type formed in said predetermined region and extending to said surface in said predetermined region and spaced from said first region, gate metallization disposed on said layer of insulating material and overlying said channel, source contact metallization extending through said layer of insulating material and making contact with said second region, and drain contact metallization extending through said layer of insulating material and making contact with said third region, said source and drain contact metallization being isolated from each other and the semiconductor body by said first and second PN junctions.

4,001,861

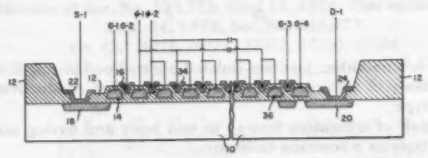
DOUBLE-LAYER, POLYSILICON, TWO-PHASE, CHARGE COUPLED DEVICE

James E. Carnes, Cranbury, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1973, Ser. No. 406,052

Int. Cl.² H01L *29/78, 29/04*

U.S. Cl. 357—24 **3 Claims**



1. In a two-phase, charge-coupled device comprising a semiconductor substrate, an insulating layer on one side of said substrate, and first rows of spaced, polysilicon, long gates alternating with second rows of long gates which overlap the adjacent first rows, said first rows being external to and said second rows being internal to said insulating layer, the improvement wherein said overlapping gates are fabricated from polysilicon material.

4,001,862

CHARGE TRANSFER DEVICE

Frederik Leonard Johan Sangster, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

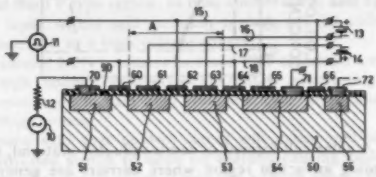
Continuation of Ser. No. 409,417, Oct. 25, 1973, abandoned. This application Nov. 12, 1975, Ser. No. 630,990

Claims priority, application Netherlands, Mar. 19, 1973, 7303777

Int. Cl.² H01L *29/78, 27/02*

U.S. Cl. 357—24 **16 Claims**

1. A charge transfer device comprising a series of stages each including first and second charge storing capacitances and at least one transistor having a control electrode and interconnecting by a main current path said first and second capacitances, said second capacitance of each stage constituting the first capacitance of the next stage, means for introducing mobile charge carriers representing signal information into at least one of the stages, and means for applying switching voltages to the control electrodes for causing serial transfer of mobile charge carriers representing signal information temporarily stored in capacitances to succeeding capacitances in a predetermined direction through the series of stages, at least one of the first and second capacitances of a plurality of said stages comprising means forming a first capacitance portion being responsive to the presence of stored signal carriers and having a high value when signal carriers are present and having a substantially lower value in the absence of signal carriers, said transistors being bipolar transistors having emitter, base and collector zones with the control electrode being the base zone of the transistor, said first capacitance portion comprising the junction capacitance between the base and collector zones and a further zone connected to one of the base and collector zones and increasing the base-collector junction capacitance, said other of the base and collector zones having an intermediate portion with a thickness and a doping concentration such that when the switching voltage is applied the intermediate portion can be depleted over its entire thickness resulting in said lower value of capacitance in the absence of signal carriers.



4,001,863

RESIN-SEALED TYPE SEMICONDUCTOR DEVICE

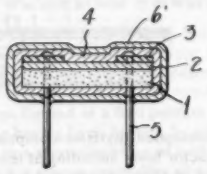
Yoshinori Kobayashi; Yoshitaka Shibata; Akira Hasegawa, all of Toyokawa, and Yoshiharu Iwatsuki, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 12, 1975, Ser. No. 640,375

Claims priority, application Japan, Dec. 19, 1974, 49-147257

Int. Cl.² H01L *27/14, 31/00, 23/28, 23/02*

U.S. Cl. 357—30 **10 Claims**



1. A semiconductor device comprising a semiconductive element, a film underlayer of an epoxy resin material entirely covering said semiconductive element, a film outer layer of chlorinated polypropylene entirely covering said underlayer, and electric conductive means electrically connected to said semiconductive element and extending through said film underlayer and said film outer layer.

4,001,864

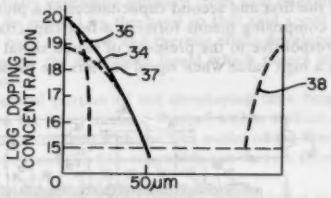
SEMICONDUCTOR P-N JUNCTION SOLAR CELL AND METHOD OF MANUFACTURE

James F. Gibbons, 320 Tennyson Ave., Palo Alto, Calif. 94301

Filed Jan. 30, 1976, Ser. No. 653,761

Int. Cl.² H01L *27/14*

U.S. Cl. 357—30 **14 Claims**



1. A solar cell formed of semiconductor material, said cell including an active region where carriers are generated by solar energy which impinges onto and penetrates the cell, means of forming a collecting junction in said cell cooperating with said active region to collect carriers generated in the active region of the cell, said cell including a portion which has a graded impurity concentration which extends over a substantial portion of said active region to form a built-in electric field whereby carriers generated in the graded portion of said active region are transported to said collecting junction primarily by drift in the electric field.

4,001,865

LIGHT CONTROLLABLE THYRISTOR

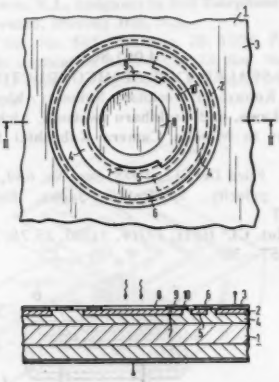
Peter Voss, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 14, 1975, Ser. No. 632,004

Claims priority, application Germany, Dec. 10, 1974, 2458401

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **5 Claims**



1. A light controlled thyristor comprising

a semiconductor body including at least four zones of alternate types of conductivity, and a light exposure region;

a first of said four zones being of one conductivity type and constituting a base zone carrying the other three zones,

a second of said zones constituting a main emitter having an edge facing said exposure region,

a third of said zones constituting a first auxiliary emitter and including said exposure region,

the fourth of said zones located between said second and third zones and constituting a second auxiliary emitter having edges facing said main emitter and said exposure region, PN junctions being formed between each of said emitters and said first zone, effective edge lengths of said PN junctions being defined as those portions of the PN junction which lie opposite electrodes in contact with said first zone

the ratio of the effective edge length of said second auxiliary emitter to the area of said exposure region and the ratio of the effective edge length of the main emitter to the edge length of the second auxiliary emitter selected to cause turn-on at said second auxiliary electrode and subsequently at said main electrode prior to turn-on at said first auxiliary electrode upon illumination of said exposure region.

4,001,866

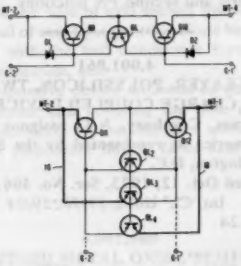
MONOLITHIC, JUNCTION ISOLATED PHOTRAC

Bernard L. Kravitz, Forest Hills, and George R. Seaton, Northport, both of N.Y., assignors to Dionics, Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 499,534, Aug. 22, 1974, Pat. No. 3,918,083, and a continuation-in-part of Ser. No. 616,040, Sept. 23, 1974. This application Oct. 16, 1975, Ser. No. 622,966

Int. Cl.² H01L *29/747*

U.S. Cl. 357—39 **8 Claims**



1. A monolithic, junction-isolated photrac comprising:

a body of semiconductor material of a first conductivity type;

a pair of transistors formed in said body and having said body as a common collector;

a pair of zones of opposite conductivity type formed in said body adjacent said transistors;

means for connecting the emitters of said transistor pair across a power source; and

means connecting each said opposite conductivity zone to one said emitter.

4,001,867

SEMICONDUCTIVE DEVICES WITH INTEGRATED CIRCUIT SWITCHES

Bernard L. Kravitz, Forest Hills, and George R. Seaton, Northport, both of N.Y., assignors to Dionics, Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 499,534, Aug. 22, 1974, Pat. No. 3,918,083. This application Sept. 23, 1975, Ser. No. 616,040

Int. Cl.² H01L *29/747*

U.S. Cl. 357—39 **17 Claims**

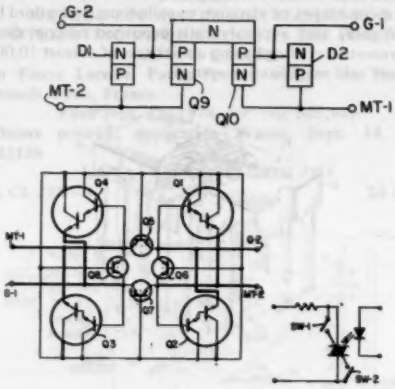
1. A photrac comprising:

a pair of transistors in common collector configuration;

a pair of diodes connected from base to emitter of each transistor;

an inherently-formed, lateral, third transistor of opposite

conductivity type from said pair of transistors and having, as a base, the collector of said pair; and



means for connecting the emitters of said pair of transistors across a power source.

4,001,868

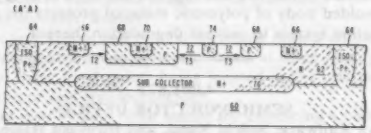
LATCHING DRIVER CIRCUIT AND STRUCTURE FOR A GAS PANEL DISPLAY

Robert Chao-Chuin Liang, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 523,773, Nov. 14, 1974. This application Sept. 24, 1975, Ser. No. 616,477

Int. Cl.² H01L *29/74, 27/02, 27/10, 27/04*

U.S. Cl. 357—46 **6 Claims**



1. A latching, high voltage driver integrated circuit structure, comprising:

A first P type semiconductor substrate;

An N type epitaxial layer formed on the surface of said substrate;

An isolation region formed in said epitaxial layer so as to enclose a first area of said epitaxial layer;

said first area of said epitaxial layer being connected to a first control signal source;

A first P type region within said first area of said epitaxial layer, having an open configuration enclosing a second area of said epitaxial layer within said first area and switchably connected to a low voltage source in response to a second control signal;

A second P type region within said second area of said epitaxial layer, having a connection to a positive current source;

An N type region within said first P type region connected to said low voltage source;

A third P type region within said first area of said epitaxial layer and connected to an output node;

Said epitaxial layer forming the collector of a first NPN transistor having said first P type region as its base and said N type region as its emitter;

Said epitaxial layer forming the base of a first PNP transistor having said first P type region as its collector and said second P type region as its emitter;

Said first NPN transistor and said first PNP transistor forming a silicon controlled switch device;

Said epitaxial layer forming the base of a second PNP transistor having said first P type region as its collector and said third P type region as its emitter;

A second NPN transistor formed in said epitaxial layer outside said isolation region, with its emitter connected to said third P type region, its base connected to said epitaxial layer within said isolation region, and its collector connected to a high voltage source;

Said second NPN transistor and said PNP transistor forming a high voltage switch for alternately connecting said output node to said high voltage source or to said low voltage source;

Whereby said first control signal will cause said silicon controlled switch to latch on thereby causing said high voltage switch to connect said low voltage source to said output node and said second control signal will cause said silicon controlled switch to latch off thereby causing said high voltage switch to connect said high voltage source to said output node.

4,001,869

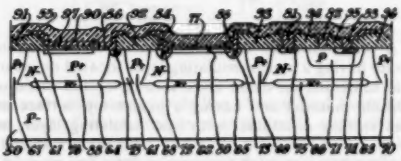
MOS-CAPACITOR FOR INTEGRATED CIRCUITS

John L. Brown, Shrewsbury, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed June 9, 1975, Ser. No. 585,278

Int. Cl.² H01L *27/04, 29/94*

U.S. Cl. 357—51 **8 Claims**



1. In an integrated circuit including at least one bipolar transistor, at least one resistor and a MOS type capacitor, said integrated circuit being formed in a P-type silicon body having an epitaxial layer of N-type conductivity grown thereon, said transistor having been formed in a first portion of said epitaxial layer, said resistor having been formed by ion implantation of P-type impurities in a second portion of said epitaxial layer at the surface thereof, a silicon oxide film of a uniform thickness between 800 and 3000 angstroms having been grown over and covering said resistor, the improvement comprising said capacitor having one electrode consisting of a P-type region in a third portion of said epitaxial layer and extending to the surface thereof, said oxide film of said uniform thickness having also been grown over said P-type electrode region, and another electrode of metal lying over and being spaced from said P-type region by said film.

4,001,870

ISOLATING PROTECTIVE FILM FOR SEMICONDUCTOR DEVICES AND METHOD FOR MAKING THE SAME

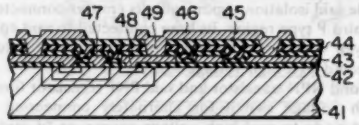
Atsushi Saiki, Musashimurayama; Kikuji Sato, Kokubunji; Seiki Harada, Hachioji; Terue Tsunoda, Tokyo, and Yoichi Oba, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 389,452, Aug. 20, 1973, abandoned. This application Nov. 30, 1973, Ser. No. 420,677

Claims priority, application Japan, Aug. 18, 1972, 47-82165

Int. Cl.² H01L *23/30*

U.S. Cl. 357—54 **20 Claims**



20. A semiconductor device which comprises an insulating film material in combination with a substrate, said insulating film being disposed on said substrate and said substrate being a material selected from the group consisting of a semiconductor material and an insulator material, said insulating film material comprising a polymer resin film obtained by reaction of an aromatic diamine, an aromatic diamine having a single aminocarbonyl group which is in an ortho position with respect to one of the amine groups and an aromatic tetracarboxylic acid dianhydride.

4,001,871

SEMICONDUCTOR DEVICE

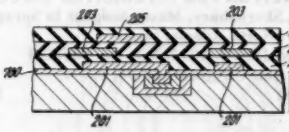
Hideo Tsunemitsu, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Division of Ser. No. 833,095, June 13, 1969, Pat. No. 3,988,214. This application Oct. 16, 1974, Ser. No. 515,228

Claims priority, application Japan, June 17, 1968, 43-41769; Dec. 28, 1968, 44-925

Int. Cl.² H01L *29/34, 23/28, 23/30;* **C25D** *5/02*

U.S. Cl. 357—54 **13 Claims**



2. A semiconductor device comprising a semiconductor substrate having a planar insulating layer located on a surface of said substrate; an oxide layer formed of the oxide of an anodizable material and having a planar top surface and a bottom surface in contact with said insulating layer; and a conductive layer comprised of said anodizable material and having a portion thereof in contact with a portion of said substrate and extending upwardly from the substrate surface through said insulating layer and into said oxide layer, said conductive layer having a top surface which is below the planar top surface of said oxide layer.

4,001,872

HIGH-RELIABILITY PLASTIC-PACKAGED SEMICONDUCTOR DEVICE

Heshmat Khajezadeh, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

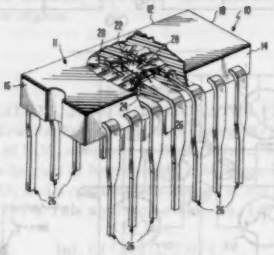
Continuation of Ser. No. 401,879, Sept. 28, 1973, abandoned. This application May 23, 1975, Ser. No. 580,286

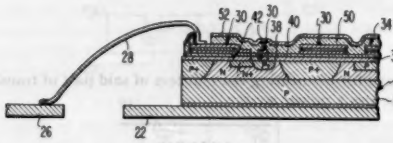
Int. Cl.² H01L *29/34, 23/48, 23/28, 23/30*

U.S. Cl. 357—54 **2 Claims**

1. A plastic-packaged semiconductor device having improved resistance to degradation in the presence of water vapor and corrosive atmospheres comprising

a body of silicon having a surface, PN junction-defining regions in said body adjacent to said surface, passivating means comprising a layer of silicon dioxide on said surfce and a silicon nitride layer on said layer of silicon dioxide, a metallization system comprising a plurality of conductors, each conductor comprising a first layer of titanium, a second layer, of platinum or palladium, and a third layer of gold, and a pyrolytically-deposited silicon dioxide protective coating having a thickness of at least 10,000 A over said metallization system,





a plurality of leads, each having a portion adjacent to said silicon body,

means for interconnecting said metallization system with said plurality of leads, and

a transfer molded body of polymeric material surrounding said silicon body, said interconnecting means, and parts of said leads, whereby the combination of the silicon dioxide protective coating and the surrounding transfer molded body of polymeric material protects the metallization system to prevent degradation thereof.

4,001,873

SEMICONDUCTOR DEVICE

Yasuya Kajiwara; Seiichi Nagai, and Hiroyasu Hagino, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1974, Ser. No. 535,209

Claims priority, application Japan, Dec. 26, 1973, 49-2156

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² H01L *29/04*

U.S. Cl. 357—59 **5 Claims**

1. In a semiconductor device of the type comprised of a semiconductor substrate having a first conductivity type and having a major surface; and a semiconductor region disposed within said substrate and having a second conductivity type opposite that of said first conductivity type, said semiconductor region having a surface portion terminating at and exposed at the major surface of said substrate and said semiconductor region jointly forming with said semiconductor substrate a PN junction defining the boundary therebetween, said PN junction having a surface portion terminating at the major surface of said substrate and defining the boundary between the surface portion of said semiconductor region of said second conductivity type and the major surface of said semiconductor substrate of said first conductivity type; the improvement

which comprises: a substantially undoped polycrystalline silicon film disposed directly on the major surface of said semiconductor substrate and extending laterally thereon to overlie the major surface of said semiconductor substrate and to overlie the surface portion of said PN junction.

4,001,874

METHOD APPARATUS AND RECORD FOR DISTRIBUTING INFORMATION IN THE FORM OF COLOR IMAGES

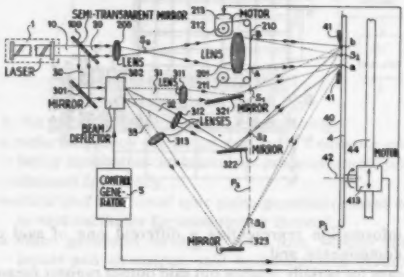
Jean Pierre Lacotte, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Sept. 13, 1974, Ser. No. 505,949

Claims priority, application France, Sept. 14, 1973, 73.33136

Int. Cl.² H04N *9/02*; **G03H** *1/28*

U.S. Cl. 358—2 **20 Claims**



7. A holographic apparatus for distributing information in the form of coloured images, comprising a holographic recording device which includes:

a source for emitting a coherent light beam;

optical splitting means for splitting said beam into an object beam and a reference beam, said object and reference beams having a fixed interference zone;

first step-by-step drive means for successively interposing, on the path of said object beam, associated images under the form of colourless transparencies, each set of three successive associated images being associated with one of said coloured images;

deflection means and optical focussing means cooperating to concentrate said reference beam at three fixed points, said three fixed points being located in the interposition plane of said transparencies;

second step-by-step drive means for displacing a photosensitive matrix in said interference zone;

and a control generator for synchronously controlling said deflexions means and said first step-by-step drive means at a first frequency, and said second step-by-step drive means at a second frequency, said first frequency being the treble of the first frequency.

4,001,875

RECORDING APPARATUS CODING CIRCUIT FOR AN IMAGE SIGNAL AND CORRESPONDING DECODING CIRCUIT

Guy Le Parquier, Paris, France, assignor to Thomson-CSF, Paris, France

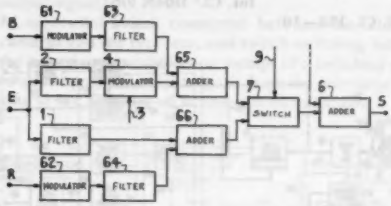
Filed Aug. 5, 1975, Ser. No. 602,012

Claims priority, application France, Aug. 9, 1974, 74.27763

Int. Cl.² H04N *9/42*, *9/02*, *5/76*

U.S. Cl. 358—4 **8 Claims**

1. A recording apparatus circuit for processing a television image signal before the recording thereof, said coding circuit comprising: filtering means for separating said image signal into first and second component signals respectively occupying a lower frequency band and a higher frequency band, said lower and higher frequency bands having equal widths; frequency translating means, including a modulator and an oscillator having an output, for translating said second component signal into said lower frequency band; switching means for alternately directing, each time for a duration equal to a predetermined whole number, not exceeding two, of field periods, to a single output said first component signal and the frequency translated second component signal; and means for adding bursts of the output signal from said oscillator to said frequency-translated second component signal during the horizontal fly back intervals. /



4,001,876

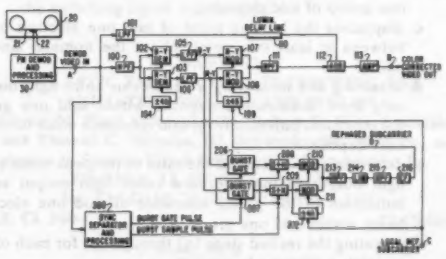
COLOR CORRECTION CIRCUIT FOR VIDEO RECORDERS

Jörg Schiess, Stallikon, and Theodor Ernst Bart, Zurich, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 613,993

Int. Cl.² H04N *5/795*

U.S. Cl. 358—8 **12 Claims**



1. A signal processing system for correcting composite color television video signals including chroma and burst components, both of which contain phasing errors, comprising:

separating means for separating a chroma signal including chroma and burst components from said composite video signal;

demodulating means coupled to said separating means for demodulating said chroma and burst components to baseband using a first subcarrier to provide a baseband chroma signal containing said burst phasing errors;

detector means coupled to said demodulator means for developing error signals from said demodulated burst component;

first modulating means coupled to said detector means for modulating said first subcarrier with said error signals to provide a second subcarrier rephased by said error signals; and

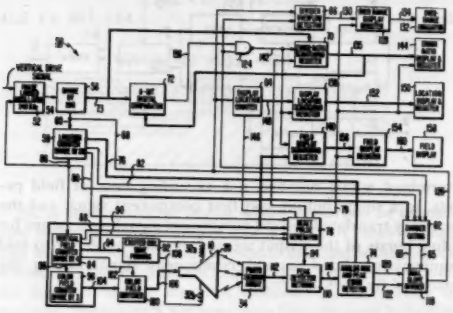
second modulating means coupled to said demodulating means for remodulating said chroma baseband components with said second subcarrier for providing a stabilized chroma signal.

4,001,877

METHOD OF MEASURING COLOR PURITY TOLERANCE OF A COLOR DISPLAY TUBE

Theodore Frederick Simpson, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,369
Int. Cl.² H04N 9/62
U.S. Cl. 358—10 **14 Claims**



1. A method of measuring purity tolerance of a color display tube having at least two electron beams and a mosaic of recurring groups of luminescent deposits disposed on a screen, each group comprising at least two different color emitting deposits, each of said deposits being located at a nominal landing point of an associated electron beam on said screen, said method comprising the steps of:

a. scanning one of said electron beams across at least a portion of said screen;

b. detecting and measuring a reference color light output from the luminescent deposit located at the nominal landing point of said one electron beam within at least one group of said deposits;

c. displacing the landing point of said one electron beam between at least two points about the nominal landing point;

d. detecting and measuring a peak error color light output only from luminescent deposits within said one group having colors different from said reference color luminescent deposit;

e. determining the value of the ratio of the peak error color light output to the reference color light output as an indication of the purity tolerance of said one electron beam within said one group; and

f. repeating the recited steps (a) through (e) for each of the remaining electron beams.

4,001,878

CHARGE TRANSFER COLOR IMAGERS

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,478
Int. Cl.² H04N 9/07
U.S. Cl. 358—41 **9 Claims**

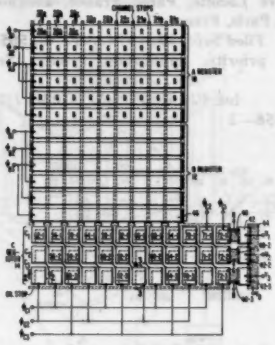
7. A color charge transfer imager system comprising, in combination;

a charge transfer imaging array comprising Q columns and R rows of charge transfer elements, said columns being arranged in groups, with N adjacent columns in each group, where N is an integer greater than 1 and represents the number of different color components into which it is desired to resolve an image projected onto the array, the N columns of one row comprising the width of a resolution element of said array;

color filter means adjacent to the image receiving surface of said array, said means comprising filters of different colors adjacent the different columns, respectively, of each group, and of the same color adjacent corresponding columns of the different groups;

output register means;

means for shifting each row of charge signals out of said array to said output register means, said means for shifting including means for separating each row into N parts, each part comprising the charge signals from the Q/N columns receiving a radiation image through filters for the same color, and each said part of a given row of



information representing a different one of said color components; and

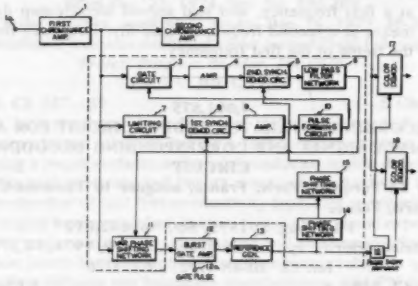
means for serially reading out said output register means for producing, for each row read from said array, signals indicative of the N color components needed for reproducing that row.

4,001,879

AUTOMATIC HUE-CONTROL APPARATUS FOR COLOR TELEVISION RECEIVERS

Yoshitomi Nagaoka, Neyagawa, and Michio Furuhashi, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 17, 1970, Ser. No. 73,017
Claims priority, application Japan, Sept. 20, 1969, 44-74790; Sept. 20, 1969, 44-74799; Sept. 20, 1969, 44-75556; Apr. 20, 1970, 45-34164; Apr. 20, 1970, 45-34166
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² H04N 9/12
U.S. Cl. 358—28 **13 Claims**

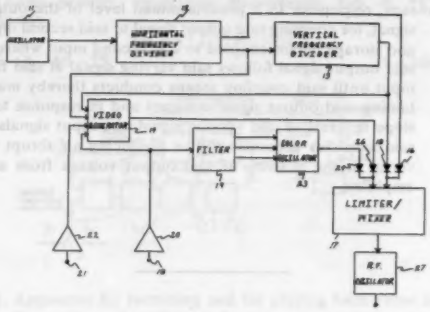


12. In a color television system, the method of altering the hue parameter in a delivered signal comprising the steps of detecting the value of said parameter at which a time average characteristic of said delivered signal occurs and processing said signal so that said value represents a predetermined hue.

4,001,880
AUDIO TO VIDEO TRANSLATOR

Robert P. Delikat, 8516 Big Rock Road, Santee, Calif. 92071

Filed June 23, 1975, Ser. No. 589,438
Int. Cl.[2] H04N 5/38, 9/00
U.S. Cl. 358—81 5 Claims



1. An audio to video translator comprising:

a radio frequency oscillator, said radio frequency oscillator being tunable to at least one predetermined television channel frequency;

vertical and horizontal sync pulse generator means coupled to said oscillator for modulation thereof;

a video generator having at least first, second and third inputs and an output, said horizontal and vertical sync pulse generator means coupled to said first and second video generator inputs, respectively, and said video generator output coupled to said oscillator for blanking and unblanking modulation thereof; and

an audio signal coupled to said third video generator input for varying said blanking and unblanking modulation of said oscillator.

5. An audio to video translator comprising:

a radio frequency oscillator, said radio frequency oscillator being tunable to at least one predetermined television channel frequency;

vertical and horizontal sync pulse generator means coupled to said oscillator for modulation thereof;

a video generator having at least, first, second and third inputs and an output, said horizontal and vertical sync pulse generator means coupled to said first and second video generator inputs, respectively, and said video generator output coupled to said oscillator for blanking and unblanking modulation thereof;

an audio signal coupled to said third video generator input for varying said blanking and unblanking modulation of said oscillator; and

a color oscillator having an output coupled to said radio frequency oscillator for color modulation thereof, said audio signal being coupled to said color oscillator for modulation thereof.

4,001,881
SWITCHED VIDEO RECORDING SYSTEM

David A. Folsom, Sudbury, Mass., assignor to QSI Systems, Inc., West Newton, Mass.

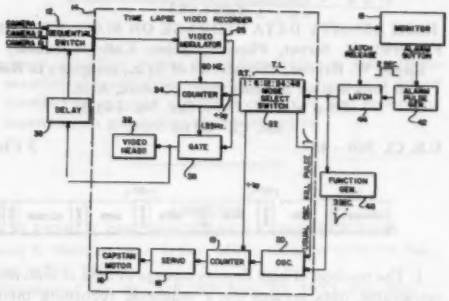
Filed Jan. 2, 1975, Ser. No. 538,006
Int. Cl.[2] H04N 5/785
U.S. Cl. 360—5 6 Claims

1. In combination,

A. a video recorder of a type having a real time operating mode wherein the video input to the recorder is applied continuously to the recorder video heads and the video tape is advanced at a selected relatively high speed and a time lapse operating mode in which the video input to the recorder is applied intermittently to the video recording heads when the heads are turned on by a video head gating signal and the tape is advanced at a selected relatively low speed and wherein the mode of the operation is selected by a manually operated mode select switch,

B. a plurality of television cameras, each producing an output signal,

C. a sequential switch connected between the television cameras and the recorder, said switch switching between the camera output signals on receipt of a switching signal so as to apply the output signals from the television cameras to the recorder on a time-shared basis, and

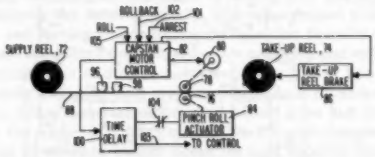


D. means for deriving the switching signals from the video head gating signals developed in the recorder, said deriving means delaying each switching signal so that it occurs after the end of the gating signal from which it is derived, whereby the recorder records the pictures from the cameras as a repetitive series of frames on the recording tape and whereby the switch settles on each camera output signal in the sequence during the time that the head is turned off after the recorder has recorded the previous video signal pursuant to the head gating signal from which the switching signal was derived.

4,001,882
MAGNETIC TAPE EDITING, PREVIEWING AND ANIMATING METHOD AND SYSTEM

Anthony M. Fiori, Schwenksville; Robert T. Fiori, Lansdale, and Thomas C. Nicholas, III, Schwenksville, all of Pa., assignors to Spectra-Vision Corporation, Philadelphia, Pa.

Filed Mar. 12, 1975, Ser. No. 556,141
Int. Cl.[2] G11B 27/08, 27/14; H04N 5/78
U.S. Cl. 360—14 22 Claims



10. A magnetic tape editing system having at least an edit deck and another deck each having motor means capable of driving tapes or webs on said decks in reverse at the same constant speed as forward speed for use of intelligence, on said respective tape or web, and means whereby a magnetic tape on the deck may be edited or modified by a data web on the other deck, including monitor means for monitoring intelligence on said magnetic tape and on said data web, motor controls for said respective motor means for selectively energizing the respective deck motors in the forward or reverse direction, drive means driven by the respective motor means for engaging and driving the respective tape and web, and actuators for the drive means whereby the respective tape and web may be immediately engaged and almost instantaneously

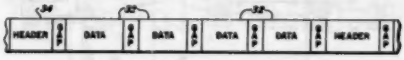
driven at motor speed in either direction and immediately disengaged and almost instantly stopped, presettable timer means, means causing said presettable timer means to time the periods during which the respective tape and web are engaged beginning with engagement and ending with disengagement of the drive means, and means causing the actuator to respond to the respective timer means to stop said drive means, means to transfer monitoring from the intelligence on the magnetic tape to that on the data web, and means to transfer the intelligence at that point and thereafter from the data web to the magnetic tape.

4,001,883

HIGH DENSITY DATA STORAGE ON MAGNETIC DISK

Frederick D. Strout, Phoenix; Jaime Calle, Glendale, and Edwin W. Herron, Phoenix, all of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Mar. 7, 1974, Ser. No. 448,863
Int. Cl.² G11B *5/09*
U.S. Cl. 360—48 **3 Claims**



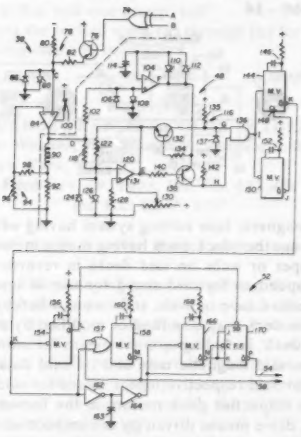
1. The method of high density storage of data in individually retrievable data sectors on a magnetic recording medium comprising the steps of magnetically recording a header for identifying a plurality of data sectors, magnetically recording after said header and in association therewith a plurality of uniform length data sectors each identifiable from said header and individually retrievable for read and record operations, and providing a gap before and after each data sector to facilitate said read and record operations of a data sector without affecting adjacent data sectors.

4,001,884

APPARATUS AND METHOD FOR RECORDING AND REPRODUCING DIGITAL-DATA

Wayne R. Herbst, Northbrook, and Paul L. Mika, Des Plaines, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Division of Ser. No. 525,435, Nov. 20, 1974. This application July 10, 1975, Ser. No. 594,835
Int. Cl.² G11B *5/00*
U.S. Cl. 360—40 **4 Claims**



1. An apparatus for detecting digital signals played back from a magnetic tape whereon said signal information is recorded in the form of magnetic flux reversals, said flux reversals, during playback, producing a varying signal having a peak amplitude, the improvement comprising:

means for amplifying said varying signal, said amplifying means having a first input receiving said varying signal and a second input, said second input providing an amplified output inverted with respect to the amplified output created by said first input; and

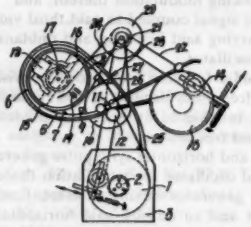
means, responsive to a predetermined level of the output signal, for coupling said output signal to said second input and storage means coupled to said second input whereby said output signal follows said varying signal at said first input until said coupling means conducts thereby maintaining said output signal constant and in response to a slope reversal of said varying signal, the input signals to said amplifier become additive producing an abrupt reversal in the polarity of said output voltage from said amplifier.

4,001,885

VIDEO RECORDING AND REPRODUCING SYSTEM

Yoshiyuki Ikushima, Hirakata, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1975, Ser. No. 554,603
Claims priority, application Japan, Mar. 1, 1974, 49-24354; July 12, 1974, 49-81023
Int. Cl.² H04N *5/785*; G11B *15/44, 15/46*
U.S. Cl. 360—70 **3 Claims**



1. A system for recording on tracks on a movable recording medium a video signal consisting of multiple fields and for reproducing said video signals comprising:

a. means for moving said transducing head means at a first relative speed with respect to said recording medium during a first operational mode to record one of said fields of said video signal on each of said tracks;

b. means for moving the same transducing head means and said recording medium at said first relative speed to reproduce said fields recorded during said first operational mode;

c. means for reducing said first relative speed between said transducing head means and said recording medium to $(1/n)$ of said first relative speed, where n is an integer equal to or greater than 2, to enable said transducing head means to record n fields of said video signal on each of said tracks in a second operational mode;

d. means for moving the same transducing head means and said recording medium at $(1/n)$ of said first relative speed to reproduce said fields recorded during said second operational mode; and

e. means for correcting for angular error loss during the reproducing of said video signals in second operational mode to thereby facilitate the use of said same transducing head means for reproducing said video signals.

4,001,886

APPARATUS WITH HEADWHEEL SERVO FOR RECORDING AND PLAYING BACK VIDEO INFORMATION

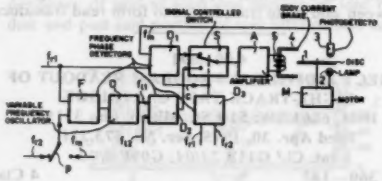
Antonius Isidorus Hofste op Bruinink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 327,492, Jan. 29, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,061

Claims priority, application Netherlands, Feb. 8, 1972, 7201609

Int. Cl.² G11B 21/04

U.S. Cl. 360—75 6 Claims



1. Apparatus for recording and for playing back video signals from a tape-shaped record carrier, comprising a head wheel for recording and playing back the video signals, means for measuring the rotational velocity of the head wheel, means for receiving a first vertical synchronization signal, first detector means connected to said velocity measuring means and to said vertical synchronization signal for providing a first control signal, means for receiving a second vertical synchronization signal read from said tape during play back, phase measuring means for providing an output signal corresponding to the phase difference between two input signals, means for connecting the first vertical synchronization signal to one of the two inputs of said phase measuring means, means connecting the second input of the phase measuring means to the rotational velocity measuring means during recording and to said means for receiving said second vertical synchronization signals during playback, a signal controlled oscillator connected to said phase measuring means for providing horizontal reference signals having a frequency controlled by the output of said phase measuring means, terminal means for providing horizontal synchronization signals read from said tape during playback and for providing horizontal synchronization signals derived from said velocity measuring means during recording, a second detector means connected to said terminal means and to said signal controlled oscillator for providing a second control signal, means for controlling the velocity of said head wheel, and switch means responsive during recording to a second control signal of said first detector means for selectively connecting said first control signal or said second control signal to said velocity controlling means.

4,001,887

MANUAL TAPE APPARATUS WITH GENERATOR FOR PROVIDING ELECTRICAL POWER

Stephen A. Platt, and Gerhard W. Wolff, both of Grand Haven, Mich., assignors to Stephen A. Platt; Vernet B. Platt; Gerhard Walter Wolff and Jeanine V. Wolff, all of Grand Haven, Mich.

Filed June 6, 1975, Ser. No. 584,465

Int. Cl.² G11B 15/42

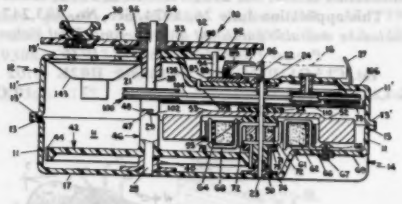
U.S. Cl. 360—90 19 Claims

1. A sound reproduction apparatus for manual operation comprising:

pickup means for detecting prerecorded information on a recording medium;

manually driven drive means including a driven member for providing relative motion between a recording medium and said pickup means;

generator means coupled to said drive means for generating electrical power when said drive means is manually operated whereby said apparatus provides electrical power when in use which can be employed operating power for an electrical amplifier; and



resilient coupling means extending between said driven member and said drive means to isolate from said driven member drive speed variations caused by said generating means when generating electrical power.

4,001,888

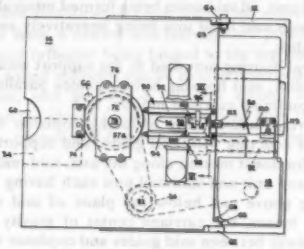
FLEXIBLE DISC RECORDER CONSTRUCTION

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Division of Ser. No. 418,299, Nov. 23, 1973, Pat. No. 3,913,137. This application Feb. 11, 1975, Ser. No. 548,976

Int. Cl.² G11B 5/016, 5/56, 25/04

U.S. Cl. 360—99 24 Claims



1. A data recorder/reproducer device for use with disc-type recording media, comprising in combination: a rigid support frame; a disc-receiver means defining a narrow receptacle for separately receiving an individual recording disc and removably retaining the latter generally in predetermined position therein, and having means for access to a disc therein; drive hub means supported on said frame, for engaging and rotating a disc received in said receiver means; a transducer head for proximately engaging and transducing signals recorded on said disc; rotary drive means coupled to said drive hub means to drive the same; and translational drive means coupled to said head to move it across a disc in said receiver means; means movably mounting at least a portion of said disc-receiver means upon said support frame for movement toward and away from said drive hub means, generally axially thereof and also angularly relative to such axis in at least two degrees of freedom; and indexing means cooperative between said frame and said disc receiver means to guide and accurately locate at least said movable portion of the latter when the same is moved toward said drive hub means and into close proximity therewith; said indexing means comprising at least two sets of engageable structures, each set spaced from the other by a distance of at least the diameter of said drive hub means and comprising an indexing surface and an element movable against such surface and connected to said receiver portion to move the latter angularly into indexed position as such element moves against said surface.

4,001,889

MOVING CARRIAGE FOR DISK HEAD POSITIONER

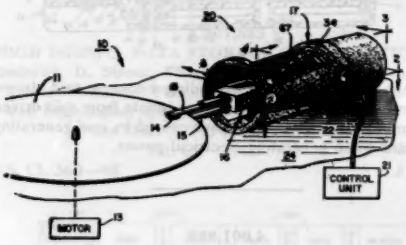
Guenter E. Schneider, Concord, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 295,370, Oct. 5, 1972, abandoned. This application June 26, 1974, Ser. No. 483,247

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² G11B *25/04, 5/54, 17/00;* **H02K** *41/02*

U.S. Cl. 360—104 **10 Claims**



1. In a rotating disk memory including a disk, means for rotating the disk and support means for the rotating means, the improvement of means for writing data onto and reading data from the disk, said means comprising:

A. a carriage adapted for linear motion along an axis, said carriage including a central frame unit and, connected to opposite ends thereof, a reading and writing head unit and a coil unit, all said units being formed integrally along the axis with said head unit being operatively associated with the disk,

B. an integral housing mounted to the support means adjacent the disk, said housing having guides parallel to the axis for confining carriage motion, and

C. said carriage additionally including coplanar engaging means for coacting with said guides and supporting said carriage for linear motion along the axis, said reading and writing head unit and said coil unit each having portions extending above and below the plane of said coplanar engaging means, the carriage center of gravity thereby being midway between said guides and coplanar with said engaging means.

4,001,890

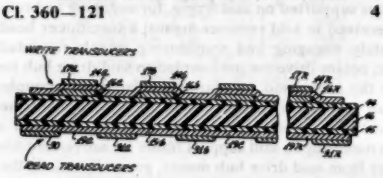
DOUBLE CHIP FLYING HEAD

Wolfgang W. O. G. Kayser, Paradise Valley, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Aug. 5, 1974, Ser. No. 495,028

Int. Cl.² G11B *5/28, 5/12, 5/30, 5/20*

U.S. Cl. 360—121 **4 Claims**



1. A multitrack magnetic read/write head for use with a movable magnetic recording medium having a plurality of tracks, said head having a plurality of transducers for each of said tracks, said head comprising:

a substrate having first and second mutually spaced surfaces normal to the plane of said medium, the distance between said first and said second surfaces being relatively small compared to the length dimension of each of said surfaces in a direction parallel to the plane of said medium;

a plurality of first magnetic write poles mounted in spaced relationship in a row on said first surface;

a plurality of second magnetic write poles each overlying a corresponding first write pole in paired alignment therewith;

a continuous write conductor, successive spaced portions of said write conductor being mounted between said write pole pairs to form successive spaced write transducers;

a plurality of write terminals mounted on said continuous conductor between said spaced write transducers;

a magnetoresistive film deposited on said second surface of said substrate and extending along the full length dimension thereof opposite said write transducers; and

a plurality of read terminals respectively mounted on said magnetoresistive film opposite corresponding spaces between said write transducers to form read transducers.

4,001,891

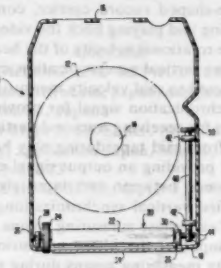
DIRECT INDIVIDUAL PROGRAM READOUT OF EIGHT-TRACK TAPE CARTRIDGE

Leon D. Held, 6861 SW. 51st St., Miami, Fla. 33155

Filed Apr. 30, 1975, Ser. No. 573,221

Int. Cl.² G11B *23/04;* **G09F** *9/00*

U.S. Cl. 360—132 **4 Claims**



1. A device for directly indicating the programs located on a particular track of a magnetic tape located within a cartridge while the programs on the particular track are being reproduced, comprising:

a tape cartridge including an elongated opening in the front of the cartridge,

an elongated program identifying member mounted for rotation in said cartridge directly behind said elongated opening, said program identifying member having a plurality of elongated faces, different ones of which are exposed behind said opening as said member is rotated, each face having the titles of programs located on a different track of said tape disposed thereon,

a drive shaft along one side of said cartridge extending substantially perpendicular to said program identifying member,

means interconnecting one end of said drive shaft and said program identifying member for causing said member to rotate when said drive shaft rotates, and

an aperture in said tape cartridge adjacent the other end of said drive shaft to allow engagement therewith by a drive means located exteriorly of said cartridge.

4,001,892

CONTAMINANT TRAPPING IN ROTATING DISK DEVICES

Vittorio Castelli, Scottsdale, N.Y., and Stephen T. Chai, Carson, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 17, 1975, Ser. No. 558,994

Int. Cl.² G11B *23/02*

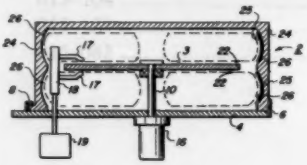
U.S. Cl. 360—133 **2 Claims**

1. A data storage system providing an ambient fluid free of contaminant particles comprising:

a magnetic disk supported for rotation about a spindle and having at least one surface capable of storing information,

a housing for enclosing said magnetic disk, the interior side surface of said housing being proximate the periphery of said magnetic disk, at least a portion of said interior side surface of said housing being curved relative to the axial direction of said spindle, said housing being fluid tight when the said data storage system is in operation such that the ambient fluid within said housing remains the same when said data storage system is in operation,

means for rotating said magnetic disk, rotation of said magnetic disk producing a centrifugal force within said housing which force causes the ambient fluid and any contaminant particles carried thereby to flow past the outer periphery of said at least one surface of said magnetic disk and past said portion of said interior side surface of



said housing, said centrifugal force being greatest adjacent said portion of said interior side surface of said housing due to said portion of said side surface of said housing being curved relative to the axial direction of said spindle, and

a tacky substance deposited on at least a portion of said portion of said interior side surface of said housing,

the action of the centrifugal force produced by rotation of said magnetic disk causing contaminant particles carried by the ambient fluid within said housing to be flung against said tacky substance as said ambient fluid within said housing moves past said tacky substance whereby said contaminant particles are permanently captured by said tacky substance.

4,001,893

PORTABLE TAPE-RECORDER

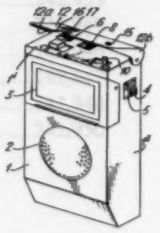
Kozo Yamamoto, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 4, 1974, Ser. No. 512,299

Claims priority, application Japan, Oct. 12, 1973, 48-119306; Oct. 12, 1973, 48-119307; Oct. 12, 1973, 48-119308; Oct. 12, 1973, 48-119309

Int. Cl.² G11B 1/04

U.S. Cl. 360—137 **2 Claims**



1. A chest-pocket type tape-recorder having a microphone on a narrow top face thereof, characterized in that a movable sound reflector for reflecting sounds from the front direction to the microphone is attached over the microphone, the narrow top face of the tape-recorder having a pause knob having an inoperative position separate from a pause position and a rewind-and-fast-forward knob having an inoperative position separate from a rewind-and-fast-forward position, said movable sound reflector being hinged to the top face in a manner that the sound reflector can be held in tilted position for sound reflection, and the sound reflector having dents or holes which, in the closed position, interlocks both the pause knob and the rewind-and-fast-forward knob in their inoperative positions.

DESIGN PATENTS

GRANTED JANUARY 4, 1977

ERRATA

For CLASS	See PATENT NO.
011–131	242,933
015–015	242,940
015–042	242,946
015–104	242,947
015–123	242,948
015–082	242,950

DESIGN PATENTS

GRANTED JANUARY 4, 1977

ERRATA

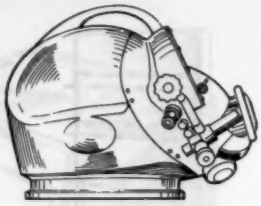
The CLASS	Not PATENT NO.
D11-131	242,223
D15-013	242,040
D15-042	242,045
D13-104	242,047
D13-123	242,048
D13-062	242,051

DESIGNS

JANUARY 4, 1977

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

242,881
DIVER'S HELMET
Richard F. Jones, Santa Barbara, Calif., assignor to General Aquadyne, Inc., Santa Barbara, Calif.
Filed Sept. 8, 1975, Ser. No. 611,301
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

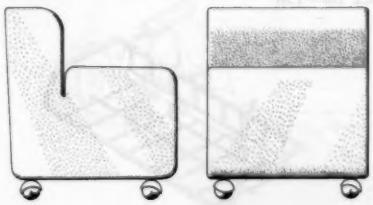


242,882
COMBINED BRUSH AND ICE SCRAPER
Otto W. Schneider, Sioux City, Iowa, assignor to Erwin Weller Company, Sioux City, Iowa
Filed Apr. 21, 1976, Ser. No. 678,727
Term of patent 14 years
Int. Cl. D4—*01*; D7—*05*
U.S. Cl. D4—06

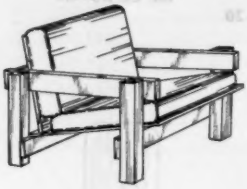
242,883
TOOTHBRUSH
Thomas J. De Marco, 12800 Westchester Trail, Chesterland, Ohio 44026
Filed Sept. 17, 1975, Ser. No. 614,006
Term of patent 14 years
Int. Cl. D4—*02*; D24—*02*
U.S. Cl. D4—28

242,884
STAND FOR POTTED PLANTS
Peter Diaz, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Jan. 7, 1976, Ser. No. 647,174
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—20

242,885
CHAIR
Lee Harold Fister, Jr., 7715 Park Creek Drive, Dayton, Ohio 45459
Filed Aug. 18, 1975, Ser. No. 605,661
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

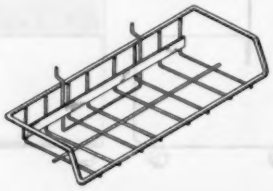


242,886
SEAT OR SIMILAR ARTICLE
Taylor M. Potter, 550 SW. Palatine Hill Road, Portland, Oreg. 97219
Filed June 2, 1975, Ser. No. 582,783
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

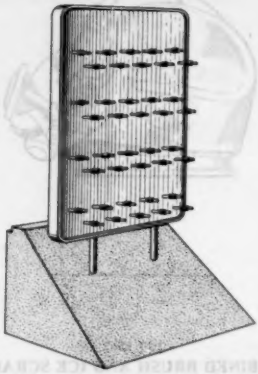


242,887
STORAGE RACK FOR ATTACHMENT TO WALL LOCKERS OR THE LIKE
Charles W. Wise, 3208 Westelle, Memphis, Tenn. 38128
Filed Aug. 6, 1975, Ser. No. 602,267
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—131

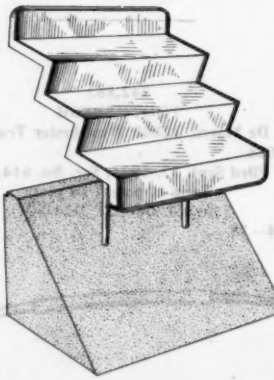
242,888
SHELF TO BE ATTACHED TO PEGBOARDS OR THE LIKE
Lowell I. Mazie, 2126 Packard Road, Huntingdon Valley, Pa. 19006; Miles Massey, 1133 Glenn St., Philadelphia, Pa. 19115, and Joseph Stopyra, 1033 E. Hunting Park Ave., Philadelphia, Pa. 19124
Filed Dec. 11, 1975, Ser. No. 639,653
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—136



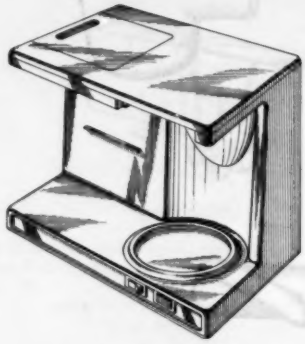
242,889
FOOTWEAR DISPLAY STAND
Douglas C. Hillman, Orange, Conn., and Herbert J. Solomon, Beechhurst, N.Y., assignors to Uniroyal, Inc.
Filed Mar. 22, 1976, Ser. No. 669,124
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157



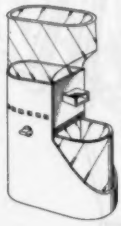
242,890
FOOTWEAR DISPLAY STAND
Douglas C. Hillman, Orange, Conn., and Herbert J. Solomon, Beechhurst, N.Y., assignors to Uniroyal, Inc.
Filed Mar. 22, 1976, Ser. No. 669,125
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—186



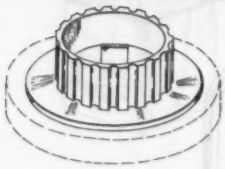
242,891
ELECTRIC COFFEEMAKER OR SIMILAR ARTICLE
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company
Filed July 28, 1975, Ser. No. 599,414
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—59



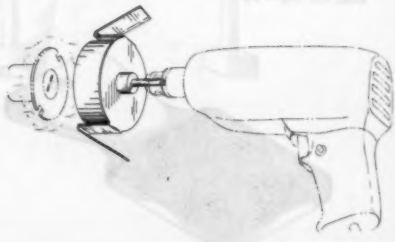
242,892
FOOD GRINDER
Lester Brown, Flushing; Paul M. Moskowitz, Brooklyn; Michael Lax, New York, all of N.Y., and Robert Dziekonski, Fort Lee, N.J., assignors to Salton, Inc., Bronx, N.Y.
Filed June 5, 1975, Ser. No. 583,997
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—155



242,893
HOLDER FOR A SCOURING IMPLEMENT
Louis J. Silver, 3434 Baker St., San Francisco, Calif. 94123
Filed Dec. 8, 1975, Ser. No. 638,345
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



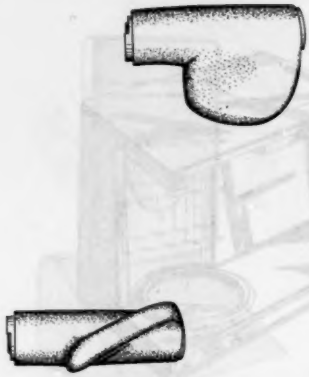
242,894
SPRINKLER HEAD GRASS TRIMMER
Kenneth W. Harris, San Antonio, Tex., assignor to Allan E. Harris, Austin; Roger T. Harris, Plano and Philip W. Eckman, San Antonio, all of, Tex.
Filed Apr. 25, 1975, Ser. No. 571,608
Term of patent 14 years
Int. Cl. D8—*3*
U.S. Cl. D8—8



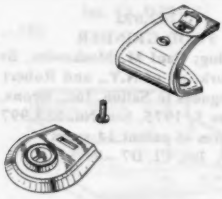
242,895
WRENCH
Phillip E. Saurenman, Pasadena, Calif., assignor to Clamp Mfg. Co., Inc. (Calif. Corporation), South El Monte, Calif.
Filed Oct. 3, 1975, Ser. No. 619,220
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—29

242,896
POOL CUE TIP FILE
Richard D. Poliquin, 18951 Newton St., Santa Ana, Calif. 92703
Filed Oct. 20, 1975, Ser. No. 623,710
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90

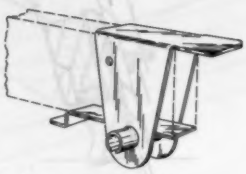
242,897
HANDLE FOR A PERCUSSIVE TOOL OR THE LIKE
Anders Gunnar Rudolf Lundmark, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Aug. 13, 1975, Ser. No. 604,219
Claims priority, application Sweden, Feb. 18, 1975, 7500038
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—107



242,898
COMBINED CLOSURE FLAP AND LOCK FOR LUGGAGE OR THE LIKE
Michael Davis, New Castle, Pa., assignor to Airway Industries Incorporated, West Pittsburgh, Pa.
Filed Nov. 20, 1974, Ser. No. 525,288
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—122



242,899
SPANNER BEAM HANGER
Stanley Barber, 3310 S. 27th St., Fort Smith, Ark. 72901
Continuation of Ser. No. D. 444,270, Feb. 21, 1974. This application July 11, 1975, Ser. No. 595,068
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



242,900
MULTI-UNIT, INDIVIDUALLY REMOVABLE, FOOD DISPENSING PACKAGE
Oscar E. Seiferth; Paul E. Grindrod; Robert L. Goller, all of Madison, and Harry L. Radloff, Sun Prairie, all of Wis., assignors to Oscar Mayer & Co. Inc.
Filed June 9, 1975, Ser. No. 585,236
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191

242,901
CARRYING CARTON
Mervin Lohrbach, Anaheim, Calif., assignor to Hoerner Waldorf Corporation, Saint Paul, Minn.
Filed Sept. 10, 1975, Ser. No. 611,868
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

242,902
COMBINED RAZOR BLADE CARTRIDGE HOLDER AND LATHER DISPENSING CAP
Saul A. Hackmyer, 2335 NE. 172nd St., North Miami Beach, Fla. 33160
Filed July 2, 1975, Ser. No. 592,621
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D9—261

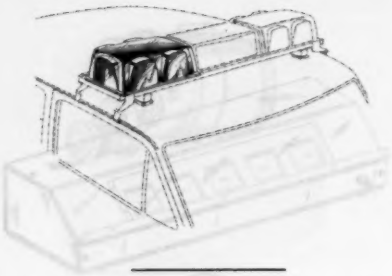
242,903
TEMPLATE FOR FORMING PANEL OPENINGS
Lucien E. Benoit, R.F.D. 2, Woonsocket, R.I. 02895
Filed May 30, 1975, Ser. No. 582,236
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

242,904
TEMPLATE FOR FORMING PANEL OPENINGS
Lucien E. Benoit, R.F.D. 2, Woonsocket, R.I. 02895
Filed May 30, 1975, Ser. No. 582,237
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

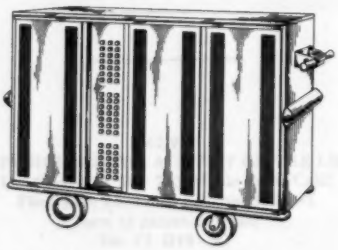
242,905
CLOCK
Richard Louis Eschenfeldt, 578 Laurel Heights Drive, Delavan, Wis. 53115
Filed July 17, 1975, Ser. No. 596,888
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—26

242,906
CARBURETOR AIR FILTER TESTER
Bernard Larson, 1717 Darlington Drive, Tampa, Fla. 33619
Filed Oct. 6, 1975, Ser. No. 620,205
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

242,907
LENS COVER FOR EMERGENCY WARNING LIGHT
Arnold O. Blaylock; Robert P. Falconer, and Charles M. Campbell, all of Fort Worth, Tex., assignors to Lectric Lites Company, Fort Worth, Tex.
Filed Oct. 2, 1975, Ser. No. 618,906
Term of patent 14 years
Int. Cl. D26—*06*; D10—*06*
U.S. Cl. D10—121



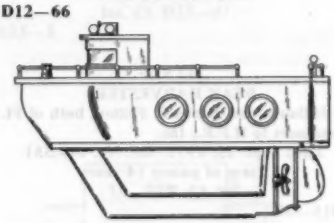
242,908
MOBILE SERVICE VEHICLE
Gene J. Seider, Bloomington, and James R. Duffy, West St. Paul, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.
Filed May 9, 1975, Ser. No. 570,191
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—22

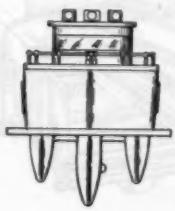


242,909
AUTO MECHANIC'S CREEPER
Jack V. Miller, Sierra Madre, Calif., assignor to Acroform, Inc., Los Angeles, Calif.
Filed Apr. 17, 1975, Ser. No. 569,064
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31

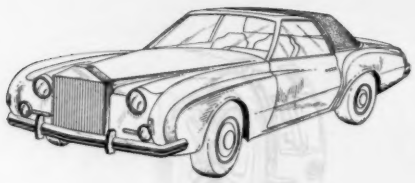
242,910
LIFTING JACK
Velu K. K. Dasan, Madras, India, assignor to Ashok Kumar Shetty
Filed Mar. 12, 1975, Ser. No. 557,626
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55

242,911
BOAT
Keamon Kurose, 7002 N. Mercer Way, Mercer Island, Wash. 98040
Filed Oct. 20, 1975, Ser. No. 624,050
Term of patent 3½ years
Int. Cl. D12—*06*
U.S. Cl. D12—66

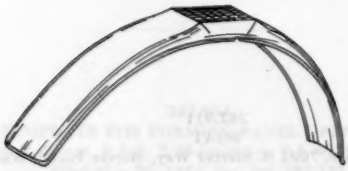




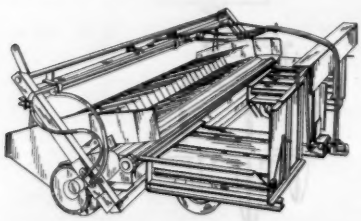
242,912
AUTOMOBILE
John D. Tedesco, North Miami Beach, Fla., assignor to Car Concepts, Inc.
Filed Sept. 25, 1975, Ser. No. 616,661
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—92



242,913
MOTORCYCLE FENDER
Preston L. Petty, 403 N. Main St., Newberg, Oreg. 97132
Filed Mar. 7, 1974, Ser. No. 448,810
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—186

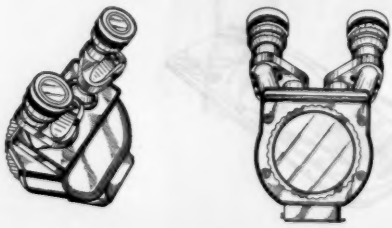


242,914
BEAN HARVESTER
Ronald L. Kilburn, and James E. Fellion, both of Ft. Collins, Colo., assignors to H.F.E., Inc.
Filed Sept. 15, 1975, Ser. No. 613,551
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27

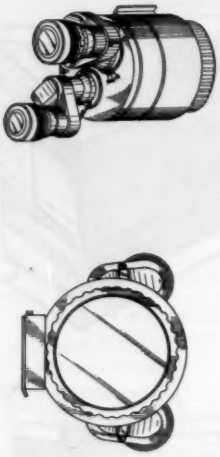


242,915
TRANSPARENCY VIEWER
Robert O. Wang, 2744 S. 61st St., Milwaukee, Wis. 53219
Filed July 17, 1975, Ser. No. 596,626
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14

242,916
MICROSCOPE OPTICAL ASSEMBLY
Kazuo Masuyama, Osaka; Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, all of Japan, assignors to Konan Camera Research Institute, Nishinomiya, Japan
Filed Jan. 21, 1976, Ser. No. 651,065
Term of patent 7 years
Int. Cl. D16—*06*
U.S. Cl. D16—58



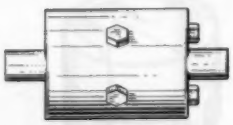
242,917
MICROSCOPE OPTICAL ASSEMBLY
Kazuo Masuyama, Osaka; Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, all of Japan, assignors to Konan Camera Research Institute, Nishinomiya, Japan
Filed Jan. 21, 1976, Ser. No. 651,140
Term of patent 7 years
Int. Cl. D16—*06*
U.S. Cl. D16—58



242,918
COPY HOLDER FOR A TYPIST OR THE LIKE
Barry J. Lar Rieu, P.O. Box 752, Menlo Park, Calif. 94025
Filed June 25, 1975, Ser. No. 589,998
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

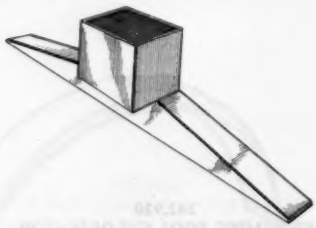
242,919
RETRIEVABLE FISH HOOK
Harry Petersen, Jr., 1860 Lark Lane, Waterloo, Iowa 50701
Filed June 23, 1975, Ser. No. 589,616
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30

242,920
SWIMMING POOL CHLORINATOR
Gregory Csurgay, 3320 NE. 18th Terrace, Fort Lauderdale, Fla. 33306
Filed July 28, 1975, Ser. No. 599,376
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

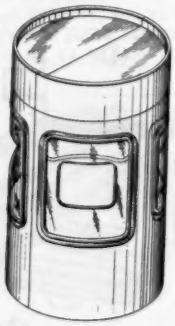


242,921
VALVE HANDLE
Earl A. Bake, and Leonard J. Stephens, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Dec. 2, 1975, Ser. No. 637,084
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

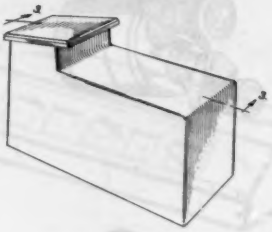
242,922
COMBINED HEAT COLLECTOR AND DIFFUSER
Robert C. Monninger, 110 N. Coolidge St., Normal, Ill. 61761
Filed Apr. 21, 1975, Ser. No. 570,251
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



242,923
SHELTER
Richard Dattner, 180 Cabrini Blvd., New York, N.Y. 10033
Filed June 23, 1975, Ser. No. 589,211
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—16

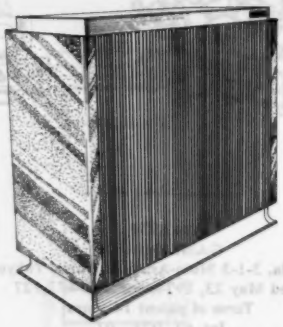


242,924
UNDERGROUND TORNADO SHELTER
Charles E. McKnight, 103 Lockwood Ave., Salem, Ind. 47167
Filed Mar. 24, 1975, Ser. No. 561,557
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—36

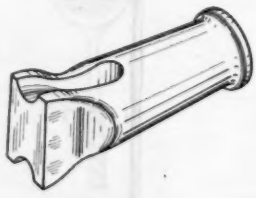


242,925
FOLDING LADDER
Athol John William Salter, 6 Elphinstone Road, P.O. Box 75, North Hobart, Tasmania, Australia (7001)
Filed Oct. 2, 1975, Ser. No. 618,818
Claims priority, application Australia, Aug. 25, 1975, 67628/75
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D25—64

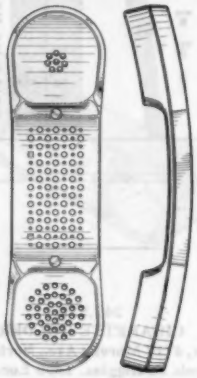
242,926
COMPUTER MODULE CABINET
Thomas C. Abrahamsen, Birmingham, Mich.; Jack K. Beduhn, Westlake Village, and Norman P. Guetschoff, Jr., Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.
Filed Dec. 19, 1975, Ser. No. 642,481
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



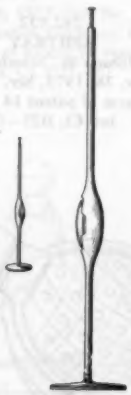
242,927
THIMBLE END STRAIN INSULATOR FITTING
Albert Medler, Jackson, Mich., assignor to Plastigage Corporation
Filed July 2, 1975, Ser. No. 592,391
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—10



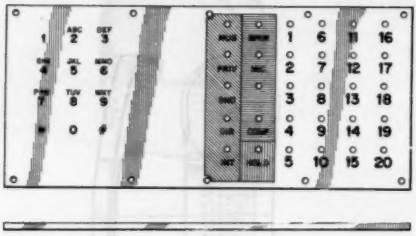
242,928
TELEPHONE HANDSET
Karl Büchin; Werner Grosse; Wolfgang Klein, and Alfred Wloch, all of Berlin, Germany, assignors to Deutsche Telephonwerke und Kabelindustrie Aktiengesellschaft, Berlin, Germany
Filed Feb. 7, 1975, Ser. No. 548,153
Claims priority, application Germany, Nov. 6, 1974, 4089
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



242,929
POLE TELEPHONE
Douglas P. Montague, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Oct. 2, 1975, Ser. No. 618,841
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

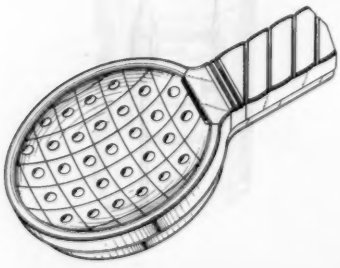


242,930
MEMBRANE SWITCH ASSEMBLY FONT
Joseph Monroe Jackson, and Shai Ronen, both of Menlo Park, Calif., assignors to Litton Business Telephone Systems, Inc., Sunnyvale, Calif.
Filed Nov. 12, 1975, Ser. No. 631,372
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

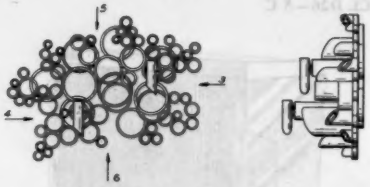


242,931
CIGARETTE HOLDER
Richard B. Kaiser, 4717 Morella Ave., North Hollywood, Calif. 91607, and Denis C. Higgins, 2390 Lorain Road, San Marino, Calif. 91108
Filed Dec. 30, 1974, Ser. No. 537,269
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—2

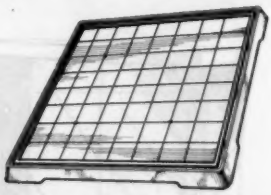
242,932
ASHTRAY
Joan B. Sickul, 10 Hobson St., Stamford, Conn. 06902
Filed Apr. 28, 1975, Ser. No. 572,228
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—22



242,933
PIPE SCULPTURE
Mervin A. Brubaker, and Myrtle E. Brubaker, both of 1024 Gettysburg Pike, Mechanicsburg, Pa. 17055
Filed Feb. 11, 1975, Ser. No. 548,952
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131



242,934
GAME BOARD
Mitsuo Tsukuda, 3-1-3 Moto-Asakusa, Taito, Tokyo, Japan
Filed May 23, 1974, Ser. No. 472,527
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

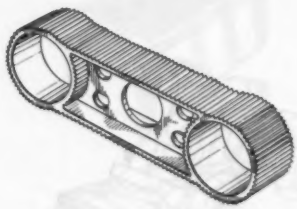


242,935
TOY TRAMPOLINE
Osamu Takahashi, No. 9-10, Tateishi 7-chome,, Katsushika, Tokyo, Japan
Filed July 7, 1975, Ser. No. 593,238
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 K

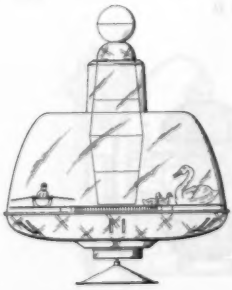
242,936
EXERCISER
Dusan Docic, 61 Clark St., Patterson, N.J. 07505
Filed Sept. 2, 1975, Ser. No. 609,365
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

242,937
TRAINING TENNIS RACQUET
Roy G. Williams, P.O. Box 11, Kernersville, N.C. 27284
Filed Sept. 22, 1975, Ser. No. 615,591
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D34—5 ST

242,938
WEAR SOLE FOR MOUNTING UPON AND LOCKING ROLLER SKATE WHEELS
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Dec. 12, 1974, Ser. No. 531,884
Term of patent 14 years
Int. Cl. 1—*D21*
U.S. Cl. D34—14 R



242,939
TOY SPINNING TOP
Peter Balleis, Hermann-Loens-Strasse 55, D-8502, Zirndorf near Nuremberg, Germany
Filed Feb. 14, 1975, Ser. No. 549,968
Claims priority, application Germany, Oct. 2, 1974, 7023
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 W

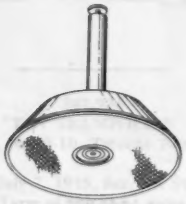


242,940
COMBINED SELF-PROPELLED ARTICULATED TRACTOR WITH LAWN MOWER APPARATUS
Hans Tage Alfred Ehrlin, and Christian Gunnar Häggstam, both of Tranas, Sweden, assignors to Stiga AB, Tranas, Sweden
Filed Dec. 18, 1974, Ser. No. 533,783
Claims priority, application Sweden, June 26, 1974, 741063
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—15

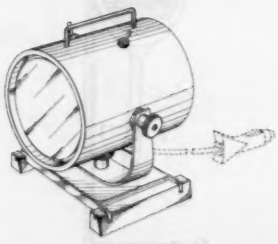
242,941
COMBINED LAMP AND PLANTER OR SIMILAR ARTICLE
Yuho Nagata, 1036 S. Normandie Ave., Los Angeles, Calif. 90006
Filed June 21, 1974, Ser. No. 481,936
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 D

242,942
HOUSING FOR A REVOLVING LAMP
Peter E. Brudy, 111 Angus Drive, Willowdale, Ontario, Canada, and John Smith, 381 Shirley Road, Southampton, England (S091HB)
Filed July 23, 1974, Ser. No. 491,001
Claims priority, application Canada, Jan. 23, 1974, D. 45635
Term of patent 14 years
Int. Cl. D26—*02;* D10—*06*
U.S. Cl. D48—24 R

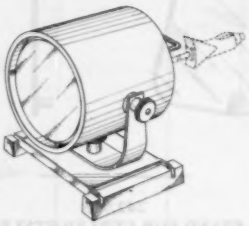
242,943
LIGHT FIXTURE, OR SIMILAR ARTICLE
Bernard Lazerson, Chicago, Ill., assignor to Solar Lighting Corporation, Chicago, Ill.
Filed May 27, 1975, Ser. No. 577,421
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



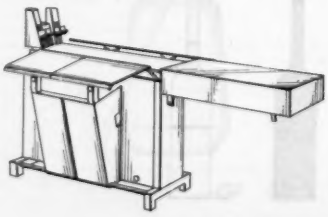
242,944
DUAL LAMP
Charles R. Moore, 1615 Merrifield, Mishawaka, Ind. 46544
Filed Dec. 22, 1975, Ser. No. 643,072
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



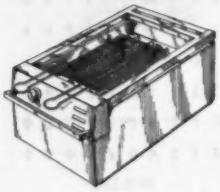
242,945
LAMP
Charles R. Moore, 1615 Merrifield, Mishawaka, Ind. 46544
Filed Dec. 22, 1975, Ser. No. 643,245
Term of patent 14 years
Int. Cl. D26—*03, 02*
U.S. Cl. D48—20 K

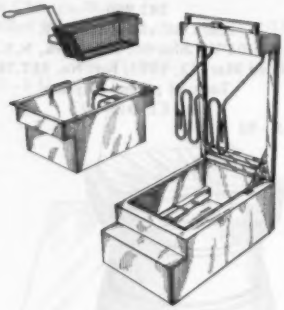


242,946
FOLDING AND SMOOTHING MACHINE FOR SKIRTS AND THE LIKE
Osmo Viljam Harjapaa, Boras, Sweden, assignor to AB Calator, a joint stock company, Boras, Sweden
Filed Mar. 19, 1975, Ser. No. 559,976
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—42

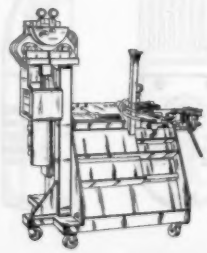


242,947
DEEP FAT FRYER
Glenn N. Graham, Cheyenne, Wyo., assignor to Wyott Corporation, Cheyenne, Wyo.
Filed Aug. 14, 1975, Ser. No. 604,845
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—104



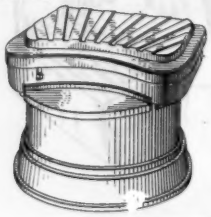


242,948
TUBE BENDER
Samuel Grimaldo, 776 San Doval, Thousand Oaks, Calif. 91360, and Leighton Harvey Watling, 1778 Ciprian Ave., Camarillo, Calif. 93010
Filed Jan. 19, 1976, Ser. No. 650,544
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123

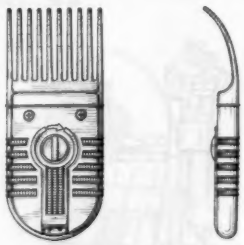


242,949
FONT OF TYPE
Stephen Earl Diamond, 1720 Pacific Ave., No. 6, San Francisco, Calif. 94109
Filed June 9, 1975, Ser. No. 585,248
Term of patent 7 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

242,950
ICE CREAM MACHINE
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Mar. 12, 1975, Ser. No. 557,789
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—82

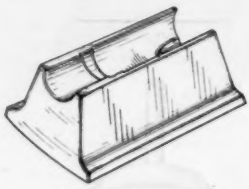


242,951
RECIPROCATING ELECTRIC HAIR COMB
Isaiah W. Bradford, 416 W. 53rd St., Los Angeles, Calif. 90037
Filed May 8, 1975, Ser. No. 575,809
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



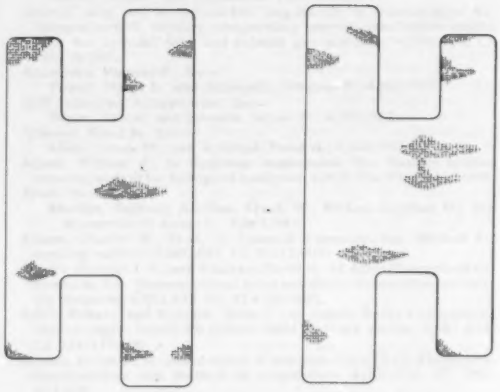
242,952
FLEXIBLE URINARY DRAINAGE CONTAINER
Robert Dyall Flinn, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 552,821
The portion of the term of this patent subsequent to Jan. 4, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—1 U

242,953
STAND FOR CURLER/STYLER
Bernard B. Bluestein, Des Plaines, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed July 11, 1975, Ser. No. 595,369
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A

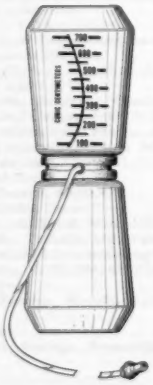


242,954
SURGICAL PLEDGETS
Robert W. Rand, 521 N. Bristol Ave., Los Angeles, Calif. 90049
Filed May 29, 1975, Ser. No. 581,867
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A

242,955
ORTHOPEDIC BRACE
Elmer M. Arluck, New York, N.Y., assignor to Thermo-Mold Medical Products, Inc., New York, N.Y.
Filed July 29, 1975, Ser. No. 600,006
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J



242,956
LUNG EXERCISE DEVICE
James G. Miller, Northwood; Wayne J. Zitkus, Toledo, and Robert J. Aul, Perrysburg, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed June 11, 1975, Ser. No. 586,788
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



242,957
TOTAL ANKLE PROSTHESIS
James T. Treace, Malibu, Calif., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.
Filed May 28, 1975, Ser. No. 581,650
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 E

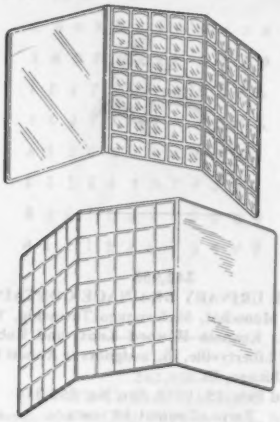
242,958
FLEXIBLE URINARY DRAINAGE CONTAINER
James Gordon Manschot, Mukwonago Township, Waukesha County, Wis.; Kenneth Howard Knox, and Robert Dyall Flinn, both of Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 552,814
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 U

242,959
NAIL CLIPPER
Tatsuya Saito, Seki, Japan, assignor to Sanwa Cutlery Co., Ltd.
Filed Oct. 25, 1974, Ser. No. 518,177
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 B

242,960
COIN WALLET

William J. Stanley, 33 Davern Road, Brantford, Ontario, Canada

Filed May 7, 1975, Ser. No. 575,190
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JANUARY, 1977

NOTE — Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Tauszig, Julio G., 4,001,495.

A. H. Robins Company, Incorporated: *See*—
Welstead, William John, Jr., 4,001,429.

Aanerud, Lars Arthur: *See*—
Pedersen, Jack Raymond; and Aanerud, Lars Arthur, 4,001,489.

Abbott Laboratories: *See*—
Tim-Wo Chu, Daniel; and Garmaise, David Lyon, 4,001,265.

Abendroth, Paul: *See*—
Kaiser, Werner; and Abendroth, Paul, 4,000,693.

Abthoff, Jorg; and Huttebraucker, Dag-Harald, to Daimler-Benz Aktiengesellschaft. Mixture compressing internal combustion engine with two cylinder rows and exhaust gas treatment. 4,000,614, Cl. 60-276.000.

Acampora, Vincent P.: *See*—
Powell, David B.; and Acampora, Vincent P., 4,001,739.

ACF Industries, Incorporated: *See*—
Bryan, Harold; and Johnson, James W., 4,000,952.

Ackroyd, Rand H.: *See*—
Miller, Louis M.; and Ackroyd, Rand H., 4,000,752.

Acord, William A., to Beckman Instruments, Inc. Sample residue cleaning system for biological analyzers. 4,000,974, Cl. 23-230.00R.

Actus, Inc.: *See*—
Mueller, Anthony A.; Bao, Frank W.; Parker, Stephen D.; and Hummeldorf, James L., 4,001,584.

Adams, Charles W., to R. A. Jones & Company, Inc. Method for erecting cartons. 4,000,687, Cl. 93-53.00M.

Adams, Herbert J. F.; and Takman, Bertil H., to Astra Pharmaceutical Products, Inc. Pharmaceutical local anesthetic composition employing saxitoxin. 4,001,413, Cl. 424-253.000.

Adler, Robert; and Rennick, John L., to Zenith Radio Corporation. Photoreceptor matrix for optical video playback system. 4,001,494, Cl. 358-127.000.

Adolph, Horst G., to United States of America, Navy. 2,2,2-Fluorodinitroethanethiol and method of preparation. 4,001,291, Cl. 260-455.00R.

Aepli, Otto T.: *See*—
Sorgenfrei, Malachi E.; and Aepli, Otto T., 4,001,133.

Acronutronic Ford Corporation: *See*—
Reisman, Elias, 4,001,595.
Smith, Terry M., 4,001,834.

AGA Aktiebolag: *See*—
Wiklund, Klas Rudolf, 4,000,652.
Wingbro, Torgny; Hjalmarsson, Jan; and Pettersson, Per August, 4,000,815.

Agarwal, Jagdish C.; Ammann, Paul R.; and Kim, Jonathan J., to Kennecott Copper Corporation. Pyrometallurgical recovery of iron from iron silicate slags. 4,001,011, Cl. 75-40.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Castaing, Raimond; Blaise, Guy; and Quettier, Roger, 4,001,582.
Commeyras, Auguste; Arnaud, Alain; Galzy, Pierre; and Jallageas, Jean-Claude, 4,001,081.
Jolles, Pierre; and Migliore-Samour, Daniele, 4,001,395.

Agence Nationale de Valorisation de la Rechereche (ANVAR): *See*—
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Agency of Industrial Science & Technology: *See*—
Megumi, Kouiti; Nagatsuma, Kazuyuki; Kashiwada, Yasutoshi; and Furuhata, Yoshio, 4,001,127.

AGFA-Gevaert, A.G.: *See*—
Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, 4,001,016.

AGFA-GEVAERT N.V.: *See*—
Vandenberghe, Antoon Leon; Heugebaert. Frans Clement; and Poot, Albert Lucien, 4,001,026.
Van Paesschen, August Jean; Van Gossum, Lucien Janbaptist; and Priem, Jan Jozef, 4,001,023.

Agnew, Kenneth Malcolm; Denroche, Charles Henry Pentland; and Hewlett, Roy. Loose leaf binders. 4,000,951, Cl. 402-22.000.

Ahn, Kie Y.; Hatzakis, Michael; and Powers, John V., to International Business Machines Corporation. Single lithography for multiple-layer bubble domain devices. 4,001,061, Cl. 156-3.000.

Airfix Industries Limited: *See*—
Rumball, Kenneth Francis, 4,001,471.

Ainin Seiki Kabushiki Kaisha: *See*—
Fukumoto, Ryoichi; and Fujita, Masatoshi, 4,000,581.

Akimoto, Taizo; Terasita, Takaaki; and Watanabe, Shigeru, to Fuji Photo Film Co., Ltd. Method for controlling the quantity of exposure in photographic printing. 4,001,594, Cl. 250-559.000.

Akiyama, Masanori: *See*—
Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, 4,001,842.

Akzona Incorporated: *See*—
Swaters, Pieter Dirk; Havinga, Reginoldus; and van der Hauw, Tjerk, 4,001,098.

Albanese, Andres; and Quate, Calvin F., to Leland Stanford Junior University, The Board of Trustees of. Method and apparatus for acousto-optical interactions. 4,001,577, Cl. 250-199.000.

Albany International Corporation: *See*—
Karpluk, Richard William, 4,000,550.

Albrecht, Hans Peter; and Neugebauer, Guenter, to Knoll A.G. Chemische Fabriken. Cardenolide glycosides and method of making the same, and therapeutic composition. 4,001,402, Cl. 424-182.000.

Alevras, Constantino J. Vacuum haircutting apparatus and method. 4,000,562, Cl. 30-133.000.

Alexander, Elmore. Taximeter protection system. 4,001,777, Cl. 340-68.000.

Alexander, Ernest John; and Mooradian, Aram, to Sterling Drug Inc. 9-Benzoyl-1,2,3,4-tetrahydrocarbazole. 4,001,270, Cl. 260-315.000.

Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich. Metal-ceramic. 4,000,983, Cl. 29-182.500.

Alferov, Zhores Ivanovich: *See*—
Charmakadze, Revaz Alexandrovich; Chikovani, Rafael Iraklievich; and Alferov, Zhores Ivanovich, 4,001,055.

Aller, David J.: *See*—
Berman, Alby M.; Walker, Richard C.; and Aller, David J., 4,001,036.

Allied Chemical Corporation: *See*—
Fisher, William Bernard; Helmer, Howard Lyle; and Pendlebury, David, 4,001,359.
Gordon, Joseph; and Sukornick, Bernard, 4,001,380.
Stephenson, Robert L.; and Schotthoefer, Jerome W., 4,000,548.

Allis-Chalmers Corporation: *See*—
Redfern, Calvin E., 4,001,530.

Allison, Donald Wayne: *See*—
Harris, Lewis Karl; Burrus, Billy Steve; and Allison, Donald Wayne, 4,000,932.

Allmanna Svenska Elektriska Aktiebolaget: *See*—
Tjernstrom, Ove; and Zetterlund, Uno, 4,001,746.

Allred, Ralph Rabun, to Bell Telephone Laboratories, Incorporated. Analog timer including controllable operate-recovery time constants. 4,001,698, Cl. 328-55.000.

Altair National Corporation: *See*—
Sitterer, Theodor K.; and Valentin, Siegfried, 4,000,672.

Altshuler, John Henry: *See*—
Braun, Walter Jacob; Altshuler, John Henry; Schlatter, Gerald Lance; and Poland, Robert LeRoy, 4,000,972.

Aluminium Suisse S.A.: *See*—
Hardt, Jean, 4,000,708.

Alza Corporation: *See*—
Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,200.
Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,401.
Shell, John W., 4,001,388.

Amalgamated Sugar Company, The: *See*—
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Amemiya, Yoshinori: *See*—
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American Cyanamid Company: *See*—
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American Electronics Corporation: *See*—
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Freed, Meier E.; and Potoski, John R., 4,001,326.
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American Optical Corporation: *See*—
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American Petroscience Corporation: *See*—
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 4,001,773.

American Potato Company: *See*—
Veeneman, John L.; Thomas, Marion E.; and Devcraux, Harry R., 4,001,451.

American Seating Company: *See*—
Vance, Richard A.; and Walworth, Robert S., 4,000,586.

AMF Incorporated: *See*—
Ferrozzi, Claudio, 4,000,599.

Ammann, Paul R.: *See—*
Agarwal, Jagdish C.; Ammann, Paul R.; and Kim, Jonathan J., 4,001,011.

AMP Incorporated: *See—*
Finley, Richard James; and Nauman, Warren David, 4,000,874.
Lynch, James Edward, 4,001,490.

Amrine, Herman Eugene; and Baker, Richard Eugene, to International Business Machines Corporation. Intruder detecting security system. 4,001,771, Cl. 340-16.00R.

Anders, Larry E.; and Sutton, Joel F., to United States of America, Air Force. Bellcrank assembly, nozzle actuator. 4,000,855, Cl. 239-265.390.

Anderson, Philip Leroy; and Gartman, William Wesley, to Texas Instruments Incorporated. Apparatus for epitaxial deposition. 4,000,717, Cl. 118-49.000.

Ando, Eiji; and Hayashi, Yoshiki, to Matsushita Electric Industrial Co., Ltd. Electrophotographic photosensitive plate having tellurium present in varying concentrations across its thickness. 4,001,014, Cl. 96-1.500.

Ando, Takao: *See—*
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Andrews, Peter: *See—*
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Anglada, Leonard R.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,000,741.

Antal, Sandor: *See—*
Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.

Anthone, Robert; and Parks, Michael P. Composition and method for soil stabilization. 4,001,033, Cl. 106-287.0SS.

Antonik, Alan S. Method for the determination of creatine phosphokinase enzyme. 4,001,088, Cl. 195-103.50R.

Aoki, Akira: *See—*
Oguchi, Noboru; Hiramatsu, Takashi; Igami, Ikuo; Aoki, Akira; Tanaka, Shogo; Seki, Toshiro; and Inoue, Takao, 4,000,960.

Aoki, Takaaki; Evrenidis, Paul; Igarashi, Ryo; and Ogura, Seiki, to International Business Machines Corporation. Linear resistance element for LSI circuitry. 4,001,612, Cl. 307-304.000.

Aoki, Takashi: *See—*
Nishikawa, Masao; Toshimitsu, Yoshihiko; and Aoki, Takashi, 4,000,785.

Aoki, Teruaki; Yamoto, Hisayoshi; Okayama, Masanori; Hirata, Yoshimi; Sato, Shuichi; and Yamada, Takaaki, to Sony Corporation. Thin film resistor. 4,001,762, Cl. 338-309.000.

Aoyama, Toshikazu: *See—*
Tsutsumi, Tadao; Kato, Nobuo; Morikawa, Masanobu; Aoyama, Toshikazu; and Nagai, Kazumi, 4,001,177.

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Puritz, Ernst; and Kraft, Erich, 4,000,774.

Aquila, Joseph. Compact crane. 4,000,823, Cl. 214-86.00A.

Araseki, Takashi; and Ochiai, Kazuo, to Nippon Electric Company, Ltd. Speech signal presence detector. 4,001,505, Cl. 179-1.0SC.

Arcan Eastern Limited: *See—*
Bolton, Frederick Arthur; and Eckebrecht, James Louis, 4,000,796.

Archer, John S.; and McCracken, Harry J., to TRW Inc. Parabolic dish and method of constructing same. 4,001,836, Cl. 343-756.000.

Ardac, Inc.: *See—*
Novak, Frank A.; and Dolejs, Anthony H., 4,000,892.

Arens Controls, Inc.: *See—*
Neyer, James U., 4,000,539.

Argoudelis, Alexander D.; Baczynskyj, Lubomir; and Mizsak, Stephen A., to Upjohn Company, The. Feldamycic acid. 4,001,267, Cl. 260-309.000.

Arima, Sumitaro; Oda, Minoru; Miyashita, Kyoichi; and Takada, Mamoru, to Tohoku Electric Power Company, Inc.; and Mitsubishi Denki Kabushiki Kaisha. Radiometric analyzer with plural radiation sources and detectors. 4,001,589, Cl. 250-336.000.

Arlt, Dieter: *See—*
Lantzsch, Reinhard; and Arlt, Dieter, 4,001,250.

Arnaud, Alain: *See—*
Commeyras, Auguste; Arnaud, Alain; Galzy, Pierre; and Jallageas, Jean-Claude, 4,001,081.

Arnhold, Hans, to Heinrich Kopp, Inhaber Theodor Simoneit, Firma. Heavy duty automatic circuit breaker. 4,001,743, Cl. 335-201.000.

Arnold, Fred E.: *See—*
Kovar, Robert F.; and Arnold, Fred E., 4,001,268.

Arthur D. Little, Inc.: *See—*
Svendsen, Noel A.; and Sylvester, Willard G., 4,000,520.

Arvai, Mihaly: *See—*
Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.

Arvanitakis, Kostas Savas. Filtration system with storage and dilution reservoirs. 4,001,115, Cl. 210-67.000.

Asada, Kiyohiko: *See—*
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Asahi Glass Co., Ltd.: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asaoka, Junichi: *See—*
Miyoshi, Jun; Kajikawa, Yoji; Ota, Akira; Asaoka, Junichi; and Kino, Yoshio, 4,001,044.

Ashburner, Adi Kaikhushiroo, to Harper & Tunstall Limited. Transport guide for pliable sheet material. 4,000,671, Cl. 83-42.000.

Ashland Oil, Inc.: *See—*
Skubon, Michael J.; Spiwak, John J.; and Naro, Rodney L., 4,001,468.

Associated Portland Cement Manufacturers Limited, The: *See—*
Watson, David; and Brown, Arthur William, 4,001,030.

Association des Ouvriers en Instruments de Precision: *See—*
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Astakhov, Jury Nikolaevich: *See—*
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Astra Pharmaceutical Products, Inc.: *See—*
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Astreon Corporation: *See—*
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Ateliers et Chantiers de Bretagne - A.C.B.: *See—*
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Audi NSU Auto Union Aktiengesellschaft: *See—*
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Seufer, Theo, 4,000,790.

Auto Specialties Manufacturing Company: *See—*
Graafsma, Richard S., 4,000,880.

Avco Corporation: *See—*
King, Robert W., 4,001,478.

Axen, Udo F., to Upjohn Company, The. 2,2-Difluoro-16-phenoxy-PGF_2 analogs. 4,001,300, Cl. 260-473.00A.

Axis S.p.A.: *See—*
Franchi, Adriano; and Brandani, Paolo, 4,001,539.

Azmoon, Majid: *See—*
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Baba, Yutaka: *See—*
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Eisenstein, Albert, 4,000,775.
Lauraitis, Kristina N., 4,000,896.
Lieb, Carl; and Piaskowski, Edward J., 4,000,720.

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. D-6-methyl-8-formyl-10α-alkoxy-8-ergolene. 4,001,242, Cl. 260-285.500.

Bachli, Emil. Multi-compartment, multi-level stacking carrier, particularly for small parts, tools, and the like. 4,000,841, Cl. 224-48.00R.

Back, Gerhard; and Fasciati, Alfred, to Ciba-Geigy AG. Heavy metal complexes of azo dyestuffs containing a heterocyclic diazo component and the residue of 5-halogeno-2,3-dihydrozypyridine as coupling component. 4,001,203, Cl. 260-146.00R.

Backes, Josef: *See—*
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Baczynskyj, Lubomir: *See—*
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Barzynski, Helmut; and Richter, Peter, 4,001,015.
Beck, Fritz, 4,001,037.

Baer, Karl: *See—*
Hoffmann, Herwig; Boettger, Guenther; Baer, Karl; Wache, Harro; Graefje, Heinz; and Koernig, Wolfgang, 4,001,344.

Baglin, John E.; DiStefano, Thomas H.; and Tu, King-Ning, to International Business Machines Corporation. Method for improving dielectric breakdown strength of insulating-glassy-material layer of a device including ion implantation therein. 4,001,049, Cl. 148-1.500.

Bail, John W.; Powell, Ronald Lee; and Smith, Frank Patterson, 2nd, to Narco Scientific Industries, Inc. DME timing apparatus and methods. 4,001,824, Cl. 343-7.300.

Bailey, David E., to Raymond Lee Organization, Inc., The, a part interest. Variable electric resistor device. 4,001,759, Cl. 338-68.000.

Baiocchi, Leandro. Steroidal derivatives of bendazolic acid and process for the preparation of the same. 4,001,219, Cl. 260-239.500.

Bakassian, Georges; and Gay, Michel, to Rhone-Poulenc. Organo-tin mercaptides with polysulphanediyl groups. 4,001,178, Cl. 260-45.75S.

Baker, Clifford Aubrey; and Miller, Rex, deceased (by Miller, Florence Edith, executrix), to Humes Limited. Manufacturing of resin-aggregate pipes. 4,001,370, Cl. 264-256.000.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-dimethylacetonitrile-α-(substituted phenoxy) alkylamides and their use as miticides. 4,001,427, Cl. 424-304.000.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-t-Butyl-α-trichlorophenoxybutyramides and their use as miticides. 4,001,430, Cl. 424-324.000.

Baker, Richard Eugene: *See—*
Amrine, Herman Eugene; and Baker, Richard Eugene, 4,001,771.

Balbi, Alessandro: *See—*
Passerini, Norina; Ermili, Aldo; Roma, Giorgio; Balbi, Alessandro; and Mazzei, Mauro, 4,001,424.

Baldwin, Mart G.; and Gehlhaus, Paul H., to Rohm and Haas Company. Solid propellant with NF_3 containing binder and energetic plasticizer. 4,001,057, Cl. 149-19.300.

Baldwin, Matt. Gabion basket emplacement apparatus and method. 4,000,923, Cl. 294-67.0AB.

Ballamy, William Charles; and Cho, Alfred Yi, to Bell Telephone Laboratories, Incorporated. Simultaneous molecular beam deposition of monocrystalline and polycrystalline III(a)-V(a) compounds to produce semiconductor devices. 4,001,858, Cl. 357-14.000.

Bandelin, Fred J.: *See*—
Feinstone, Wolffe Harry; and Bandelin, Fred J., 4,001,391.

Banks Barbados Breweries Limited: *See*—
Clark, John, 4,001,436.

Bannerman, George Louis. Electronic antenna. 4,001,696, Cl. 325-373.000.

Bao, Frank W.: *See*—
Mueller, Anthony A.; Bao, Frank W.; Parker, Stephen D.; and Hummeldorf, James L., 4,001,584.

Bar-on, Ari, to Xerox Corporation. Two speed, duel purpose document handling system. 4,000,943, Cl. 355-8.000.

Barak, Morton; and Winchell, Harry S., to Medi-Physics, Inc. Process for preparing radiopharmaceuticals. 4,001,387, Cl. 424-1.000.

Barba, Ramon C. Method of promoting flowering in fruit plants. 4,001,002, Cl. 71-65.000.

Barbano, Normand: *See*—
Regenos, Kenneth M.; and Barbano, Normand, 4,001,837.

Bardotti, Angelo, to Honeywell Information Systems Italia. Data processing system having a plurality of input/output channels and physical resources dedicated to distinct and interruptible service levels. 4,001,784, Cl. 340-172.500.

Barker, Philip Edwin; and Deeble, Ronald Edward. Method of operating a chromatographic apparatus. 4,001,112, Cl. 210-31.00C.

Barlow, George J., to Honeywell Information Systems, Inc. Modularly addressable units coupled in a data processing system over a common bus. 4,001,790, Cl. 340-172.500.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
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Barracudaverken Aktiebolag: *See*—
Wallin, Erik W.; and Lindquist, Gunnar, 4,001,827.

Barrett, Gerald George; Hornung, Louis Michael; and Jones, Calvin Coolidge, Jr., to International Business Machines Corporation. Method of testing and repairing magnetic bubble domain chip. 4,001,673, Cl. 324-34.00R.

Barrett, M. James. Covalently bound biological substances to plastic materials and use in radioassay. 4,001,583, Cl. 250-303.000.

Barry Research Corporation: *See*—
Fenwick, Robert B.; and Gilliland, Clinton R., 4,001,692.

Barsova, Antonina Petrovna: *See*—
Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich; Khlyntsev, Alexandr Sergeevich; Barsova, Antonina Petrovna; and Rodionova, Galina Alexeevna, 4,000,636.

Bart, Theodor Ernst: *See*—
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Bartley, John E.: *See*—
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Bartmann, Wilhelm: *See*—
Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, 4,001,431.

Barton, George Clifford, deceased (by Barton, Margaret Ellen, executrix), to USM Corporation: Shoe machine shoe size and side sensing arrangements. 4,000,535, Cl. 12-126.000.

Barton, Margaret Ellen, executrix: *See*—
Barton, George Clifford, deceased, 4,000,535.

Barzynski, Helmut; and Richter, Peter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Method for the production of printing plates using photosensitive compositions. 4,001,015, Cl. 96-33.000.

BASF Aktiengesellschaft: *See*—
Diem, Hans; Libowitzky, Herbert; Matthias, Guenther; Dudeck, Christian; and Lehmann, Gunter, 4,001,337.
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BASF Wyandotte Corporation: *See*—
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Bassett, Terry J.: *See*—
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Bassett, Walter D.; and Bassett, Terry J. Windshield washer service apparatus. 4,000,835, Cl. 222-183.000.

Bates, Albert M.: *See*—
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Bates, Ronald Frank: *See*—
Wang, Chih Chun; Lausman, Thomas Clifford; and Bates, Ronald Frank, 4,001,099.

Batha, Howard D.; and Cross, Leslie E., to Carborundum Company, The. Process for generating periodic non-uniform electric field, and for removing polarizable particulate material from fluid, using ferroelectric apparatus. 4,001,102, Cl. 204-186.000.

Batson-Cook Company: *See*—
Gaskins, Jack C., 4,000,865.

Batzer, Hans: *See*—
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 4,001,236.

Bauer, Ewald, to Rosenthal Technik AG. One or multi-part composite umbrella-shaped insulator. 4,001,491, Cl. 174-209.000.

Bauer, Frederick T.; and Geary, Frederick J., to Robertshaw Controls Company. Ignition system. 4,001,638, Cl. 315-209.0SC.

Bauer, Hannsgeorg; and Otto, Josef. Process for the manufacture of steels with a high chromium content. 4,001,009, Cl. 75-13.000.

Bauer, Karl, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Heating apparatus for the heat treatment of yarns. 4,001,548, Cl. 219-388.000.

Baugh, Jarod L.: *See*—
McCardle, Arthur, Jr.; Wright, John J.; and Baugh, Jarod L., 4,000,611.

Baum, Allen J.: *See*—
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; and Baum, Allen J., 4,001,569.

Baumann, Niklaus; and Schlunke, Hans-Peter, to Ciba-Geigy AG. Process for the photopolymerization of ethylenically unsaturated compounds. 4,001,017, Cl. 96-35.100.

Baumeister, Heard Kilpatrick; Sebrosky, Robert Allen; and Wagner, Walter Rudolph, to International Business Machines Corporation. Print wire attachment. 4,000,801, Cl. 197-1.00R.

Baumel, Anton, to Gebr. Bohler & Co. AG. High silicon-containing austenitic-iron-chromium-nickel alloys. 4,000,984, Cl. 29-183.000.

Baumgartner Papiers S.A.: *See*—
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Bawden, Orval C.; and Harris, Leonard F., to United States Steel Corporation. Method and apparatus for securing swage sleeves upon a wire rope splice. 4,000,557, Cl. 29-525.000.

Baxter Travenol Laboratories, Inc.: *See*—
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Bayer Aktiengesellschaft: *See*—
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Becher, Klaus, to Carl Becher OHG Planen- und Zelte-Fabrik. Large shelter umbrella. 4,000,750, Cl. 135-16.000.

Beck, Fritz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Lead batteries. 4,001,037, Cl. 429-188.000.

Becker, Carl H.; Wong, Herman; and Kaspari, William J., to Precision Instrument Co. Non-photographic, digital laser image recording. 4,001,840, Cl. 346-76.00L.

Beckman Instruments, Inc.: *See*—
Acord, William A., 4,000,974.
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Beecham Group Limited: *See*—
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Beerens, Hugo; Feldmann, Hugo; and Schlanzke, Claus Georg, to Schloemann-Siemag Aktiengesellschaft. Method of cooling a moving strand of hot material. 4,000,625, Cl. 62-63.000.

Behrenz, Wolfgang: *See—*
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Bell, Reuben H., to Owens-Corning Fiberglas Corporation. Aniline based reaction product. 4,001,329, Cl. 260-570.00D.

Bell, Robert Graham, to National-Standard Company, Limited. Tire building apparatus. 4,001,070, Cl. 156-398.000.

Bell Telephone Laboratories, Incorporated: *See—*
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Kaminow, Ivan Paul, 4,000,937.
Koontz, Donald Eldridge; and Landau, Uziel, 4,001,093.
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Bellomo, Andrea. Homokinetic joint. 4,000,629, Cl. 64-21.000.

Bendix Corporation, The: *See—*
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Bendix Machine Tool Corporation: *See—*
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Bennett, Donald R.; and McHard, James A., to Dow Chemical Corporation. Method for reducing the reproductive function of mammals. 4,001,403, Cl. 424-184.000.

Bentley, Richard H.: *See—*
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Berdou, Jean: *See—*
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Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A-30641 and process for production thereof. 4,001,086, Cl. 195-81.000.

Berg, Robert H. Displacement metering with independent ancillary flow. 4,001,678, Cl. 324-71.0CP.

Berger, Harald: *See—*
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Berkey Photo, Inc.: *See—*
Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., 4,001,848.

Berkowitz, Ami E., to General Electric Company. Recording head array with passive pole. 4,001,841, Cl. 346-74.100.

Berlincourt, Don A. Electrically actuated piezoelectric high voltage impact mechanism. 4,001,615, Cl. 310-8.300.

Berman, Alby M.; Walker, Richard C.; and Aller, David J., to Energy Development Associates. System for improving charge efficiency of a zinc-chloride battery. 4,001,036, Cl. 429-67.000.

Bertelsen, Viggo C., Jr.: *See—*
Friant, James E.; Bruton, William J.; Bertelsen, Viggo C., Jr.; and Yates, Patrick A., 4,000,696.

Besser, Paul J.: *See—*
Henry, Rodney D.; and Besser, Paul J., 4,001,793.

Bhatti, Nazir A.: *See—*
Klawitter, Jerome J.; and Bhatti, Nazir A., 4,000,525.

Bianchini, Antonio. Congruent modular building segments. 4,000,589, Cl. 52-79.500.

Biber, Conrad H., to Polaroid Corporation. Preferential power distribution system for battery powered camera having electronic flash unit. 4,001,639, Cl. 315-241.00P.

Biber, Conrad H., to Polaroid Corporation. Single trigger photographic strobe unit. 4,001,640, Cl. 315-241.00P.

Bidlack, Richard Henry; Egan, Wayne Jay; and Miller, Steven Gary, to Bell Telephone Laboratories, Incorporated. Direct station selection hold arrangement. 4,001,517, Cl. 179-99.000.

Bied-Charreton, Philippe; Le Carvennec, Francois; and Spitz, Erich, to Thomson-CSF. Communication system for disseminating coded digital data in analogue form utilizing an orthogonal transformation. 4,001,564, Cl. 235-152.000.

Bied-Charreton, Phillippe; Le Carvennec, Francois; and Spitz, Erich, to Thomson-CSF. Communication system for disseminating coded digital data in analogue form utilizing an orthogonal transformation. 4,001,563, Cl. 235-152.000.

Biehl, Roy A. Seed germinator. 4,000,580, Cl. 47-14.000.

Biela, John A.; and Weirich, H. Paul. Toilet flushing apparatus. 4,000,526, Cl. 4-57.00P.

Bielefeldt, Ernst-August, to Messerschmitt-Bolkow-Blohm GmbH - Division Hamburger Flugzeugbau. Centrifugal treatment of fluids. 4,001,121, Cl. 210-512.00R.

Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., to Kendall Company, The. Syringe assembly. 4,000,741, Cl. 128-218.0NV.

Bindicator Company: *See—*
Snyder, Ellery P., 4,000,650.

Bingham, Larry A., to NRG Nufuel Company; and Reserve Synthetic Fuels, Inc., part interest to each. Adsorption process. 4,000,990, Cl. 55-30.000.

Biondetti, Mario, to Escher Wyss Limited. Roll for a rolling mill. 4,000,979, Cl. 29-115.000.

Birch Brothers Southern, Inc.: *See—*
Straujups, John E., 4,000,863.

Birch, James D.; Mohr, Max C.; and Waterman, Raymond C., Jr., to Raytheon Company. Ferrite phase shifter having conductive material plated around ferrite assembly. 4,001,733, Cl. 333-24.100.

Birchenough, Arthur G., to United States of America, National Aeronautics and Space Administration. Electronic analog divider. 4,001,602, Cl. 307-229.000.

Biricz, Stefan: *See—*
Scheinecker, Alois; and Biricz, Stefan, 4,000,840.

Birmingham Small Arms Company Limited: *See—*
Carside, David Walker, 4,000,721.

Blaise, Guy: *See—*
Castaing, Raimond; Blaise, Guy; and Quettier, Roger, 4,001,582.

Blasingame, Thomas W. Demountable equipment support frame for truck bodies. 4,000,924, Cl. 296-35.00A.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See—*
Eibe, Werner W., 4,000,635.

Blendax-Werke R. Schneider GmbH & Co.: *See—*
L'Orange, Raul, 4,001,393.

Blin, Marie Francoise; Gaussens, Gilbert; and Lemaire, Francis, to Commissariat a l'Energie Atomique. Process for coating surfaces having a base of epoxy resins modified by unsaturated acids and coatings obtained by means of said process. 4,001,462, Cl. 427-44.000.

Block, Jacob: *See—*
Markofsky, Sheldon Boris; and Block, Jacob, 4,001,134.

Bluestone, Henry; Scozzie, James A.; and Ignatoski, Joseph A., to Diamond Shamrock Corporation. α-Chloroacetanilide selective herbicides. 4,001,325, Cl. 260-562.00B.

Blurton, Keith F.; and Sedlak, John M., to Energetics Science, Inc. Device for the detection and measurement of NO and NO_2 gases. 4,001,103, Cl. 204-195.00R.

Boah, John K., to General Electric Company. Temperature gradient zone melting utilizing infrared radiation. 4,001,047, Cl. 148-1.500.

Bober, Robert E., to American Optical Corporation. Constant current-pulse led drive circuit. 4,001,667, Cl. 323-1.000.

BOC Limited: *See—*
Bove, Ottavio; Grossi, Galeazzo; and Kirkley, David William, 4,001,543.

Bock Products, Inc.: *See—*
Weber, Charles A., 4,000,911.

Bockelmann, Wilfried; Grozinger, Hans; and Wobky, Peter Ulrich, to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft. Control installation for the proportioning of a secondary air quantity for improvement of the combustion in internal combustion engines or the afterburning of the exhaust gases of internal combustion engines. 4,000,615, Cl. 60-277.000.

Boehm, Arthur F., to Sperry Rand Corporation. Automatic configuration of main storage addressing ranges. 4,001,786, Cl. 340-172.500.

Boettger, Guenther: *See—*
Hoffmann, Herwig; Boettger, Guenther; Baer, Karl; Wache, Harro; Graefje, Heinz; and Koernig, Wolfgang, 4,001,344.

Bogert, Clayton. Spout forming means for containers. 4,000,838, Cl. 222-529.000.

Boggs, Alben C.; and Shirey, Robert D., to Emerson Electric Co. Electric heating elements. 4,001,547, Cl. 219-322.000.

Bohman, Nils-Erik: *See—*
Derman, Karl Gustaf; and Bohman, Nils-Erik, 4,000,933.

Bolgiano, Duane Ridgely, to International Mobile Machines Corporation. Code-controlled ringer attachment for telephones including a-peak-to-peak gain controlled amplifier. 4,001,708, Cl. 330-29.000.

Bolker, James H.: *See—*
Zoephel, Richard L.; and Bolker, James H., 4,000,521.

Bolliger, Frederic E., to Garrett Corporation, The. Fluid control valve and method. 4,000,607, Cl. 60-39.030.

Bolton, Frederick Arthur; and Eckebrecht, James Louis, to Arcan Eastern Limited. Braking device. 4,000,796, Cl. 193-35.00A.

Bonitz, Eckhard: *See—*
Sander, Bruno; Bonitz, Eckhard; Berbner, Heinz; and Hoffmann, Manfred, 4,001,157.

Bonk, Franz; and Burger, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for telephone systems for facilitating data traffic between the subscriber stations and a central data processor. 4,001,507, Cl. 179-2.0DP.

Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., to Alza Corporation. Novel polymerized, cross-linked, stromal-free hemoglobin. 4,001,200, Cl. 260-112.50R.

Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., to Alza Corporation. Blood substitute and blood plasma expander comprising polyhemoglobin. 4,001,401, Cl. 424-177.000.

Boosen, Karl-Josef: *See—*
Moulin, Francois; and Boosen, Karl-Josef, 4,001,255.

Booth, William M.; and Rieth, James E., to Reith, James E. Trolling apparatus. 4,000,653, Cl. 73-343.00R.

Borden, Inc.: *See—*
Lankes, Richard George, Jr., 4,001,027.
Mierke, Ralph Carl; and Busco, Joseph James, 4,000,598.

Borror, Alan L., to Polaroid Corporation. Indole dehydro phthalides and naphthalides. 4,001,275, Cl. 260-326.12R.

Borror, Alan L., to Polaroid Corporation. Indole phthalides and naphthalides. 4,001,278, Cl. 260-326.12R.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,235.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,252.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,258.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,259.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodeposition of epoxy compositions. 4,001,101, Cl. 204-181.000.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Method of producing epoxy group-containing, quaternary ammonium salt-containing resins. 4,001,156, Cl. 260-29.2EP.

Bosworth, Clive James Arthur, to British Steel Corporation. Monitoring of welding. 4,001,497, Cl. 358-101.000.

Botta, Artur, to Bayer Aktiengesellschaft. Preparation of N-chloroformyl-carbamic acid amides and esters. 4,001,318, Cl. 260-544.00C.

Boudreau, Jerry N.: *See—*
Reardanz, Eugene H.; and Boudreau, Jerry N., 4,001,449.

Bove, Ottavio; Grossi, Galeazzo; and Kirkley, David William, to Saipem S.p.A.; and BOC Limited. Apparatus for a laser welding of a pipeline, particularly suitable for application on pipe-laying ships. 4,001,543, Cl. 219-121.00L.

Bowman Van Hoeven, Helene E.; Brenner, L. Martin; and Loev, Bernard, to SmithKline Corporation. 2-Alkoxy(and 2-alkoxyalkyl)-2-quinolyl-thioacetamides. 4,001,241, Cl. 260-283.00S.

Boyer, Lionel, to Agence Nationale de Valorisation de la Rechereche (ANVAR). Rotary electrical machines comprising a superconductive winding. 4,001,617, Cl. 310-52.000.

Boyesen, Eyvind, to Performance Industries, Inc. Engine valve means and porting. 4,000,723, Cl. 123-73.0AA.

Bozzelli, John W.; and Shier, George D., to Dow Chemical Company, The. Morpholinones as selective solvents for aromatic hydrocarbons. 4,001,107, Cl. 208-323.000.

Brack, Alfred: *See—*
Harnisch, Horst; and Brack, Alfred, 4,001,253.

Braden, Rudolf: *See—*
Wagner, Kuno; and Braden, Rudolf, 4,001,290.

Brandani, Paolo: *See—*
Franchi, Adriano; and Brandani, Paolo, 4,001,539.

Brandes, Erich: *See—*
Mau, Gunter; Jacobsen, Gunter; and Brandes, Erich, 4,001,332.

Brandstatter, Horst. Home intercom telephone set. 4,001,506, Cl. 179-1.00H.

Braukmann, Bernhard W.; and Vollmer, Rudolf. Regulating drive, especially for a thermostatically controlled valve shaft. 4,000,848, Cl. 236-68.00R.

Braun, Robert M.: *See—*
Morris, Derek S.; and Braun, Robert M., 4,001,814.

Braun, Walter Jacob; Altshuler, John Henry; Schlatter, Gerald Lance; and Poland, Robert LeRoy, to Hemotec, Inc. Measuring system for the pharmacological manipulation of the coagulation mechanism in blood and for the elapsed coagulation time. 4,000,972, Cl. 23-230.00B.

Bray, Douglas: *See—*
Porter, David H.; and Bray, Douglas, 4,001,574.

Bray, William Edward, to Texas Instruments Incorporated. Switching regulator power supply. 4,001,663, Cl. 321-2.000.

Breindl, Otto: *See—*
Ottl, Adolf; Dost, Fredy; and Breindl, Otto, 4,000,730.

Brennen, Michael B.: *See—*
Gyugyi, Laszlo; Brennen, Michael B.; and Stacey, Eric J., 4,001,671.

Brenner, L. Martin; and Brush, Charles K., to SmithKline Corporation. Substituted benzofurans and benzothiophenes. 4,001,426, Cl. 424-285.000.

Brenner, L. Martin: *See—*
Bowman Van Hoeven, Helene E.; Brenner, L. Martin; and Loev, Bernard, 4,001,241.

Breslow, Jeffrey D., to Marvin Glass & Associates. Game device. 4,000,899, Cl. 273-101.000.

Briles, Franklin S. Expanding head riveting method and system. 4,000,680, Cl. 85-37.000.

Brinkmann, Ludwig: *See—*
Reske, Eckart; Brinkmann, Ludwig; Fischer, Hartmut; and Rohrscheid, Freimund, 4,001,192.

Bristol-Myers Company: *See—*
Granatek, Alphonse Peter; and Kaplan, Murray Arthur, 4,001,409.
Partyka, Richard Anthony; and Crenshaw, Ronnie Ray, 4,001,237.
Partyka, Richard Anthony; and Crenshaw, Ronnie Ray, 4,001,238.

British Hovercraft Corporation Limited: *See—*
Crago, William Arthur, 4,000,710.

British Nuclear Fuels Limited: *See—*
Williams, John Llewellyn; and Stokes, Phillip John, 4,001,689.

British Steel Corporation: *See—*
Bosworth, Clive James Arthur, 4,001,497.

Brodersen, Rolf K., to United States of America, Navy. Drift-compensated free-rotor gyro. 4,000,660, Cl. 74-5.430.

Brown, Arthur William: *See—*
Watson, David; and Brown, Arthur William, 4,001,030.

Brown, John L., to Sprague Electric Company. MOS-capacitor for integrated circuits. 4,001,869, Cl. 357-51.000.

Brown, Lloyd H.; Eftax, Daniel S. P.; and Kopp, Joseph N., to Quaker Oats Company, The. Apparatus and method for manufacturing cores and molds. 4,000,770, Cl. 164-21.000.

Brown, Michael J. Pneumatic automated milking parlor. 4,000,718, Cl. 119-14.030.

Brown, Robert W.: *See—*
Foris, Peter L.; Brown, Robert W.; and Phillips, Paul S., Jr., 4,001,140.

Brown, Victor R.: *See—*
Katz, Seymour; and Brown, Victor R., 4,001,592.

Brown & Williamson Tobacco Corporation: *See—*
Summers, Thomas Wade, 4,000,748.

Bruff, William; and Kongsgaarden, Ole Andreas, to Elkem-Spigerverket. Apparatus for feeding charge to an electric smelting furnace. 4,001,488, Cl. 13-33.000.

Brumley, Ralph E.; Riordan, Mathew B.; and Bentley, Richard H., to Eastman-Whipstock, Inc. Stabilizer. 4,000,549, Cl. 24-263.0KS.

Brumlik, George C., to Ingrip Fasteners Inc. Method for making self-gripping devices having integral trains of gripping elements. 4,001,366, Cl. 264-147.000.

Bruniaux, Pierre. Process for producing straw-bottomed chairs. 4,000,555, Cl. 29-417.000.

Brunnett, Carl J.: *See—*
Mehrbrodt, Alfonso W.; Mog, Walter F.; and Brunnett, Carl J., 4,001,580.

Bruscemi, Frank, to Lawrence Peska Associates, Inc., a part interest. Posture device. 4,000,736, Cl. 128-80.00R.

Brush, Charles K.: *See—*
Brenner, L. Martin; and Brush, Charles K., 4,001,426.

Bruton, William J.: *See—*
Friant, James E.; Bruton, William J.; Bertelsen, Viggo C., Jr.; and Yates, Patrick A., 4,000,696.

Bryan, Harold; and Johnson, James W., to ACF Industries, Incorporated. Weld joint having a weld droppings receiving pocket. 4,000,952, Cl. 403-271.000.

BSG Designs Inc.: *See—*
Newton, Clifford, 4,000,964.

Buchele, Wesley Fisher: *See—*
Christenbury, Gerald Davis; and Buchele, Wesley Fisher, 4,000,975.

Buchholtzer, Claude; Deman, Pierre; Drobecq, Michel; and Oger, Pierre, to Thomson-CSF. Channel board for telephony transmission equipment using single side band multiplexing. 4,001,511, Cl. 179-15.0FS.

Buckley, Keith: *See—*
Horrocks, Derek; Buckley, Keith; and Vernon, Alan John, 4,001,445.

Buehler, Arthur; Fasciati, Alfred; and Hoelzle, Gerd, to Ciba-Geigy AG. Water-soluble, fiber-reactive phenylazodihydroxy, methyl, cyanopyridine dyestuffs. 4,001,205, Cl. 260-156.000.

Buhler, Fritz: *See—*
Scheuchzer, Fredy; Buhler, Fritz; and Chiesa, Alfred, 4,000,699.

Bulens, Michel: *See—*
Delmon, Bernard; LeMaitre, Jacques; and Bulens, Michel, 4,001,362.

Bundy, Gordon L., to Upjohn Company, The. Phenyl-substituted prostaglandin-β-type anologs. 4,001,286, Cl. 260-410.90R.

Bur, Philip W.: *See—*
Saul, Glenn; and Bur, Philip W., 4,001,703.

Burge, Joseph C.: *See—*
Nash, Dudley O.; Beavers, Robert G.; Burge, Joseph C.; Castells, Onofre T. M.; and Parker, Alan I., 4,000,610.

Burge, Merle M. Gravitational irrigation system and method of installing. 4,000,620, Cl. 61-12.000.

Burgener, Frank Robert, Jr.: *See—*
Drews, Reinhold Alvin; and Burgener, Frank Robert, Jr., 4,000,631.

Burger, Wolfgang: *See—*
Bonk, Franz; and Burger, Wolfgang, 4,001,507.

Burgers, Bernhardus Walter Antonius, to U.S. Philips Corporation. Pulse radar apparatus. 4,001,825, Cl. 343-7.500.

Burgess, John Alwyn; and Schofield, Zeb Douglas, III. Belt-on tree step (BOTS). 4,000,788, Cl. 182-92.000.

Burke, Robert Virgil; and Hester, Thomas Eugene, to Litton Systems, Inc. Power controller for microwave magnetron. 4,001,537, Cl. 219-10.55B.

Burkholder, Ward J., to Goodyear Tire & Rubber Company, The. Purification of dialkylbenzene dihydroperoxide. 4,001,338, Cl. 260-610.00A.

Burlington Industries, Inc.: *See—*
Griffin, Charles E., Jr., 4,000,704.
Imboden, Walter H., 4,000,630.

Burns, Carmen D., to National Semiconductor Corporation. Copper-to-gold thermal compression gang bonding of interconnect leads to semiconductive devices. 4,000,842, Cl. 228-180.00A.

Burns, Richard W., to Hughes Aircraft Company. π-Loop phase bit apparatus. 4,001,734, Cl. 333-31.00R.

Burrell, George R.: *See—*
Holland, Warren E.; and Burrell, George R., 4,001,764.

Burroughs Corporation: *See—*
Denny, William Michael; Hagen, Russell Louis; and Leung, Steve Ka-Lai, 4,001,699.
Wisner, Daniel A.; Mathamel, Flavius A.; and Schmalzriedt, Truman T., 4,001,665.

Burroughs Wellcome Co.: *See—*
Maxwell, Robert Arthur; and Copp, Frederick Charles, 4,001,433.

Burrus, Billy Steve: *See—*
Harris, Lewis Karl; Burrus, Billy Steve; and Allison, Donald Wayne, 4,000,932.

Burton Aluminum Classics, Inc.: *See—*
Burton, Richard, 4,000,597.
Burton, Richard, to Burton Aluminum Classics, Inc. Decorative trim for buildings. 4,000,597, Cl. 52-716.000.
Busco, Francis J., to Float. Isolation module. 4,000,749, Cl. 135-1.00R.
Busco, Joseph James: *See—*
Mierke, Ralph Carl; and Busco, Joseph James, 4,000,598.
Buskirk, George T.: *See—*
Conery, William James; and Smith, Donald D., 4,001,533.
Buss, Gerald H.; Clarridge, Chester H.; and Hollands, Daniel H., to Rochester Instrument Systems, Inc. Annunciator system with direct field wiring. 4,001,797, Cl. 340-181.000.
Butler, James G., to Massey-Ferguson Industries Limited. Combine header with bottom support beam. 4,000,600, Cl. 56-220.000.
Butzen, Kenneth B., to Pepsico, Inc. Game ball. 4,000,894, Cl. 273-65.0EG.
Bykhovsky, David Grigorievich. Method of producing electrode units for plasmatrons. 4,001,461, Cl. 427-37.000.
Bylund, Per Gunnar; and Lyberg, Bertil, to Telefonaktiebolaget L M Ericsson. Device for measuring small frequency differencies. 4,001,680, Cl. 324-78.00Z.
Byrne, Leroy H.: *See—*
Mol, Hans C.; Byrne, Leroy H.; and Fassman, Arnold, 4,000,889.
C. A. Holweg S.A.: *See—*
Kurtz, Bernard; and Spizzo, Ermes, 4,000,864.
Cabiro, Jorge Canals: *See—*
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,001,414.
Caciagli, Valerio: *See—*
Re, Luciano; and Caciagli, Valerio, 4,001,333.
Cahill, Robert Francis, to International Telephone and Telegraph Corporation. Process of fabricating wiring harness. 4,000,558, Cl. 29-625.000.
Cahn, Robert P.: *See—*
Geissler, Paul R.; and Cahn, Robert P., 4,001,111.
Li, Norman N.; Hucal, Taras; and Cahn, Robert P., 4,001,109.
Calderazzo, Franklin J.; and Fassman, Arnold, to Pitney-Bowes, Inc. Paper thickness adjustment device for a collator. 4,000,890, Cl. 270-58.000.
California Metal Enameling Company: *See—*
Penton, Hugh V., 4,000,882.
Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., to Upjohn Company, The. Pyridylalkyl phenyl ureas and their N-oxides. 4,001,256, Cl. 260-295.00E.
Calle, Jaime: *See—*
Monahan, Earnest M.; Patterson, Garvin W.; and Calle, Jaime, 4,001,783.
Strout, Frederick D.; Calle, Jaime; and Herron, Edwin W., 4,001,883.
Camerman, Philippe Jean Andre, to Labofina S.A. Production of ethylphenols. 4,001,342, Cl. 260-624.00R.
Canadian General Electric Company Limited: *See—*
Lonseth, Palmer; Selkirk, Neil Robertson; and Panter, Hubert Gerald, 4,001,616.
Young, John A. I., 4,001,649.
Canon Kabushiki Kaisha: *See—*
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,000,942.
Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu; and Takahashi, Kiyoshi, 4,000,940.
Murata, Shinji, 4,001,581.
Okajima, Hidekazu; Takigawa, Tomoshi; Hirata, Noritsugu; Toyama, Masamichi; and Ichiyanagi, Toshikazu, 4,000,941.
Carbonetta, Reno Raymond, Jr., to RCA Corporation. Gas laser. 4,001,720, Cl. 331-94.50G.
Carborundum Company, The: *See—*
Batha, Howard D.; and Cross, Leslie E., 4,001,102.
Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 4,001,477.
Cardenas, Carlos G., to SCM Corporation. Preparation of haloesters from dienes. 4,001,307, Cl. 260-491.000.
Cardinal, Daniel E., Jr. Vacuum conduit pick-up device with improved control. 4,000,602, Cl. 56-328.00R.
Cargile, William P.; and Morrison, W. Andrew. Wedge action electrical test probe. 4,001,679, Cl. 324-72.500.
Carl Becher OHG Planen- und Zelte-Fabrik: *See—*
Becher, Klaus, 4,000,750.
Carlo Erba S.p.A.: *See—*
Passerini, Norina; Ermili, Aldo; Roma, Giorgio; Balbi, Alessandro; and Mazzei, Mauro, 4,001,424.
Carlson, Robert G.; and Harrison, Robert W., to General Electric Company. Impact resistant blade. 4,000,956, Cl. 416-230.000.
Carmen, Norman. Identification card holder. 4,000,570, Cl. 40-1.500.
Carnes, James E., to United States of America, Navy. Double-layer, polysilicon, two-phase, charge coupled device. 4,001,861, Cl. 357-24.000.
Carniglia, Stephen C.: *See—*
Pearson, Michael J.; Rigge, Ronald J.; and Carniglia, Stephen C., 4,001,144.
Carol, John A., Jr.; and Peterson, Raymond J., to General Motors Corporation. Multiple indication display. 4,001,776, Cl. 340-52.00F.
Carroll, Robert L. Roving can piston. 4,000,934, Cl. 312-71.000.
Carside, David Walker, to Birmingham Small Arms Company Limited. Rotary internal combustion engines. 4,000,721, Cl. 123-8.010.
Carson, Monte A. Ironing table. 4,000,569, Cl. 38-135.000.
Carter, Philip S., Jr., to Watkins-Johnson Company. Interconnecting circuit for EBS diodes and method. 4,001,600, Cl. 307-149.000.
Cartes, Juan Bosch: *See—*
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,001,414.
Cash, Derek J., to Minnesota Mining and Manufacturing Company. Process of sensitizing silver halide emulsions with heterocyclic sulfur compounds. 4,001,025, Cl. 96-107.000.
Cassens, Nicholas, Jr., to Kaiser Aluminum & Chemical Corporation. Gunnable refractory composition. 4,001,029, Cl. 106-67.000.
Castaing, Raimond; Blaise, Guy; and Quettier, Roger, to Agence Nationale de Valorisation de la Recherche (ANVAR). Local surface analysis. 4,001,582, Cl. 250-288.000.
Castelli, Vittorio; and Chai, Stephen T., to Xerox Corporation. Contaminant trapping in rotating disk devices. 4,001,892, Cl. 360-133.000.
Castells, Onofre T. M.: *See—*
Nash, Dudley O.; Beavers, Robert G.; Burge, Joseph C.; Castells, Onofre T. M.; and Parker, Alan I., 4,000,610.
Castonguay, Roger N.: *See—*
Jencks, Charles L.; and Castonguay, Roger N., 4,001,742.
Catanese, Carmen Anthony: *See—*
Endriz, John Guiry; and Catanese, Carmen Anthony, 4,001,619.
Caterpillar Tractor Co.: *See—*
Schexnayder, Lawrence F., 4,000,683.
Unruh, Dale H.; and Proksch, Frederick D., 4,000,910.
Cauge, Thomas P.; and Kocsis, Joseph, to Signetics Corporation. Double diffused metal oxide semiconductor structure with isolated source and drain and method. 4,001,860, Cl. 357-23.000.
Cauge, Thomas P.: *See—*
Meiling, Gerald S.; and Cauge, Thomas P., 4,001,048.
Cedrone, Nicholas J. Inertial arresting device for feeder. 4,000,798, Cl. 193-40.000.
Celmer, Walter D.; Moppett, Charles E.; Cullen, Walter P.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Antibiotic Compound 41,012. 4,001,397, Cl. 424-116.000.
Central Soya Company, Inc.: *See—*
Williams, Merl A., 4,001,452.
Centrax Limited: *See—*
Stevens, Arthur Royden, 4,000,583.
Cerniway, Leon A.; and Entrikin, Donald W., to U. S. Divers Company. Buoyancy compensator. 4,000,534, Cl. 9-342.000.
Cerutti, Richard L.: *See—*
Knavish, Leonard A.; and Cerutti, Richard L., 4,001,001.
Chai, Stephen T.: *See—*
Castelli, Vittorio; and Chai, Stephen T., 4,001,892.
Chaly, Georgy Vladimirovich: *See—*
Postolaty, Vitaly Mikhailovich; Venikov, Valentin Andreevich; Astakhov, Jury Nikolaevich; Chaly, Georgy Vladimirovich; and Kalinin, Lev Pavlovich, 4,001,672.
Chamberlin, Thomas A.; and Madison, Norman L., to Dow Chemical Company, The. Oxazoline and/or oxazine-modified polymers. 4,001,147, Cl. 260-2.50B.
Chambers, George S.; and Lane, L. Jubin, to General Electric Company. Active filter with inverse option. 4,001,712, Cl. 330-85.000.
Chambers, Joseph W.; and McTaggart, Lester E., to United States of America, Air Force. Ablative surface insulator. 4,001,475, Cl. 428-175.000.
Channell, Ronald E.; O'Pray, John E.; and Roberto, Francisco Q., to United States of America, Air Force. Fluorine generating formulation for use in chemical lasers. 4,001,136, Cl. 252-187.00R.
Channell, Ronald E.: *See—*
O'Pray, John E.; Channell, Ronald E.; and Roberto, Francisco Q., 4,001,135.
Channing, Harry M.; and Eberle, William J., to General Battery Corporation. Interchange and alignment apparatus and method for heated platen heat sealing machine. 4,001,066, Cl. 156-152.000.
Charil, Jean Pierre Georges: *See—*
Prudhon, Lucien Pierre Emile; and Charil, Jean Pierre Georges, 4,001,524.
Charles Machine Works, Inc., The: *See—*
Martin, James Scott; and Cook, Robert E., 4,000,879.
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Charmakadze, Revaz Alexandrovich; Chikovani, Rafael Iraklievich; and Alferov, Zhores Ivanovich. Semiconductor light-emitting diode and method for producing same. 4,001,055, Cl. 148-172.000.
Charransol, Pierre; Hauri, Jacques; and Fontana, Serge Robert, to International Standard Electric Corporation. Electronic switching element. 4,001,781, Cl. 340-147.00C.
Chase-Shawmut Company, The: *See—*
Kozacka, Frederick J., 4,001,749.
Salzer, Erwin, 4,001,748.
Cheetham, Ian; Dunkerley, Kenneth; Greenhaigh, Colin William; Moyse, James Albert; and Newton, David Francis, to Imperial Chemical Industries Limited. Coloration of polyesters. 4,001,169, Cl. 260-40.00P.
Chem-Trol Pollution Services, Inc.: *See—*
McCord, Andrew T.; Wagner, Louis E.; and Reese, Theodore J., 4,001,031.
Chemotronics International, Inc.: *See—*
Geen, Henry C.; Vinton, Clarence S.; and Franklin, Charles H., 4,001,110.

Cheng, Rudolph Hon-Ching; and Lim, Jin-Twan, to Northern Electric Company Limited. Single amplifier immittance network. 4,001,735, Cl. 333-80.00R.

Cherubim, Martin: *See—*
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Chesneau, Rene; and Martin, Jean-Marc, to Thomson-CSF. Vertical antenna having an off-center supply. 4,001,832, Cl. 343-747.000.

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Chet, Ilan: *See—*
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Chevron Research Company: *See—*
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Chiaves, Carlo. Shoring structure for embankments. 4,000,622, Cl. 61-39.000.

Chibana, Masanobu: *See—*
Futamase, Tsuyoshi; and Chibana, Masanobu, 4,000,675.

Chicago Bridge & Iron Company: *See—*
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Chiesa, Alfred: *See—*
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Chikovani, Rafael Iraklievich: *See—*
Charmakadze, Revaz Alexandrovich; Chikovani, Rafael Iraklievich; and Alferov, Zhores Ivanovich, 4,001,055.

Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Sakunaga, Kenichi; and Umemura, Eiji, to Mitsubishi Rayon Co., Ltd. Method for producing a crimped yarn. 4,000,605, Cl. 57-157.0TS.

Chinoin Pharmaceutical and Chemical Works Ltd.: *See—*
Feuer, Laszlo, 4,001,396.

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Choate, Paul V.: *See—*
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Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Phenyl derivatives. 4,001,339, Cl. 260-612.00D.

Chow, Philip Y., to Lin Offshore Engineering, Inc. Multi-component offshore platform. 4,000,624, Cl. 61-88.000.

Christenbury, Gerald Davis; and Buchele, Wesley Fisher, to Iowa State University Research Foundation, Inc. Method of measuring damage to grain. 4,000,975, Cl. 23-230.00B.

Christensen, John D., to Duff-Norton Company, Inc. Mechanical actuator. 4,000,664, Cl. 74-424.80R.

Christiansen, Frank, to Norapp A/S. Liquid level indicator. 4,000,651, Cl. 73-314.000.

Chromalloy American Corporation: *See—*
Hadler, Howard, 4,000,805.

Chu, Chin-Chiun, to Mobil Oil Corporation. Selective production of para-xylene. 4,001,346, Cl. 260-671.00M.

Chu, Victor Fu Hua, to Du Pont de Nemours, E. I., and Company. Fast drying ink. 4,001,164, Cl. 260-31.80N.

Chuchin, Alexandr Evgenievich; Proskurin, Leonid Leonidovich; Kalnova, Irina Jurievna; and Rozhkov, Vladimir Viktorovich. Process for producing vinyl polymers. 4,001,173, Cl. 260-45.70R.

Chung, Chan I. Extruder screw. 4,000,884, Cl. 259-191.000.

Chung, Jackson, to Reliance Electric Company. Dry fluid drive. 4,000,793, Cl. 192-105.00A.

Churov, Vyacheslaw Petrovich: *See—*
Panchenkov, Georgy Mitrofanovich, Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.

Chute, Richard, to Eaton Corporation. Gas turbine engine combustion chamber. 4,000,608, Cl. 60-39.360.

Chute, Richard, to Eaton Corporation. Radial flow gas turbine engine with annular combustor liner. 4,000,609, Cl. 60-39.360.

Ciarico, Anthony J.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,000,741.

Ciba-Geigy AG: *See—*
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Buehler, Arthur; Fasciati, Alfred; and Hoelzle, Gerd, 4,001,205.
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Ciba-Geigy Corporation: *See—*
Dear, Robert Ernest Arthur; and Falk, Robert Allan, 4,001,305.
Dellian, Kurt A.; and Isharani, Jayanti V., 4,000,969.
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Ciminero, Anthony S. Method and apparatus for pulling tubes. 4,000,556, Cl. 29-427.000.

Cities Service Company: *See—*
Rosenwald, Gary W., 4,000,780.

Citizen Watch Co., Ltd.: *See—*
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Civardi, Frank P.: *See—*
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Clabburn, Robin James Thomas: *See—*
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Clama Industri Aktiebolag: *See—*
Jansson, Olof T., 4,000,763.

Clark Equipment Company: *See—*
Patton, Jon R., 4,000,795.
Wolfe, Robert W., 4,000,662.

Clark, Jack, Jr. Ignition system bypass unit. 4,000,729, Cl. 123-148.0DS.

Clark, John, to Banks Barbados Breweries Limited. Beverages. 4,001,436, Cl. 426-29.000.

Clarke, William A. Baby food feeder. 4,001,444, Cl. 426-110.000.

Clarridge, Chester H.: *See—*
Buss, Gerald H.; Clarridge, Chester H.; and Hollands, Daniel H., 4,001,797.

Clemens, Jon Kaufmann; Fuhrer, Jack Selig; and Ross, Michael David, to RCA Corporation. Defect detection and compensation apparatus for use in an FM signal translating system. 4,001,496, Cl. 358-127.000.

Clevepak Corporation: *See—*
Klafka, Frank L., 4,000,891.
Zeller, Allen D., 4,000,845.

Clinkscales, Matthew. Active dual channel tuning control. 4,001,709, Cl. 330-30.00R.

Clinton, William Patrick: *See—*
Jindra, Henri; and Clinton, William Patrick, 4,001,454.

Clovis, James S.; and Sullivan, Francis R., to Rohm and Haas Company. Ring phosphonates as flame-retardants. 4,001,176, Cl. 260-45.80R.

Coale, Sidney C. Ski boot snow scraper. 4,000,909, Cl. 280-11.37E.

Cohen, Sy, to Visual Components, Inc. Marquee letters. 4,000,573, Cl. 40-142.00R.

Coldren, Chester P., to Eaton Corporation. Mine bolt tension indicator. 4,000,681, Cl. 85-62.000.

Cole, Gary William: *See—*
Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, 4,001,084.

Cole, Howard W., Jr. Dust suppression with small bubble foam in cyclone. 4,000,992, Cl. 55-87.000.

Colgate-Palmolive Company: *See—*
Renold, Adolph, 4,001,123.

Colin, Jean Paul, to Ateliers et Chantiers de Bretagne - A.C.B. System for interconnecting a barge and a pusher tug. 4,000,714, Cl. 114-248.000.

Collister, Richard L., Jr.: *See—*
Corbley, Eugene K.; and Collister, Richard L., Jr., 4,001,634.

Combustion Engineering, Inc.: *See—*
Harris, Lewis Karl; Burrus, Billy Steve; and Allison, Donald Wayne, 4,000,932.
Rosso, John B.; and Garrett, Sheyrl Wayne, 4,001,701.

Comfort Products, Inc.: *See—*
Rinehart, Dixie L., 4,000,524.

Commeyras, Auguste; Arnaud, Alain; Galzy, Pierre; and Jallageas, Jean-Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for the preparation of amides by biological hydrolysis. 4,001,081, Cl. 195-29.000.

Commissariat a l'Energie Atomique: *See—*
Blin, Marie Francoise; Gaussens, Gilbert; and Lemaire, Francis, 4,001,462.
Germond, Jean-Claude; Le Mouee, Theodore; Marchal, Paul; Petit, Michel; and Vertut, Jean, 4,000,819.

Communications International Corporation: *See—*
Johnson, Richard C., 4,001,508.

Concrete Curb Inlets Co.: *See—*
Langeliers, Walter J.; and Langeliers, Roger W., 4,000,953.

Cone, Donald R., to Nihon Denshi Kabushiki Kaisha; and Sharp Kabushiki Kaisha. Single lens, multi-beam system and method for high resolution recording of information on a moving recording medium and article. 4,001,493, Cl. 358-127.000.

Conery, William James; and Smith, Donald D., to Keener, Robert M.; McNeil Corporation; and Buskirk, George T. Sealed level control switch for sump pumps. 4,001,533, Cl. 200-84.00C.

Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximilian, to Warner-Lambert Company. Octahydro and decahydro derivatives of acid S, an antibiotic produced by *Polyangium cellulosum* var. fulvum. 4,001,398, Cl. 424-122.000.

Conrad, Richard A., to Teledyne, Inc. Electrical switch. 4,001,744, Cl. 335-205.000.

Continental Can Company, Inc.: *See—*
Westfall, James E., 4,000,825.

Continental Oil Company: *See—*
Schwab, Peter A., 4,001,482.

Cook, Albert M.; Engleman, Frank A., Jr.; and Simes, James G., to Sutter Hospitals Medical Research Foundation. Digital waveform generator for automatic respiratory ventilators. 4,001,700, Cl. 328-129.000.

Cook, Billy G., to Rohr Industries, Inc. Sound attenuating structural honeycomb sandwich material. 4,001,473, Cl. 428-116.000.

Cook, John Stone; and Personick, Stewart David, to Bell Telephone Laboratories, Incorporated. Optical communication system with bipolar input signal. 4,001,578, Cl. 250-199.000.

Cook, Robert E.: *See—*
Martin, James Scott; and Cook, Robert E., 4,000,879.

Cooter, Terry A. Hand-held basketball game device. 4,000,898, Cl. 273-101.000.

Copal Company Limited: *See—*
Takahashi, Tamotsu, 4,001,849.

Copp, Frederick Charles: *See—*
Maxwell, Robert Arthur; and Copp, Frederick Charles, 4,001,433.

Corbley, Eugene K.; and Collister, Richard L., Jr., to General Electric Company. Discharge lamp having thermal switch starter. 4,001,634, Cl. 315-73.000.

Cordis Corporation: *See—*
Stevens, Robert C., 4,000,739.

Cornell-Dubilier Electric Corporation: *See—*
Robinson, William M., 4,001,657.

Corney, Martin, to General Dynamics Corporation Pomona Division. Self-separating sabot. 4,000,698, Cl. 102-93.000.

Corning Glass Works: *See—*
Frost, Rodney I.; Lachman, Irwin M.; and Rieth, Paul H., 4,001,028.
Rittler, Hermann L., 4,000,998.

Corte, Ernesto; and Maitra, Pradeep, to General Atomic Company. Radiation flux measuring device. 4,001,590, Cl. 250-336.000.

Corwin, Edward J. Marking document and template assembly and method of making the assembly. 4,001,549, Cl. 235-61.12R.

Cosco, Robert J.; Hebert, Roger T.; and Gates, Paul E., to GTE Sylvania Incorporated. Soft glass flashtube. 4,001,624, Cl. 313-185.000.

Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, to Rhone-Poulenc S.A. 3-(Isopropyl amino alkoxy)-2-phenyl-isoindolin-1-ones. 4,001,271, Cl. 260-325.0PH.

Courtois, Peter D., to Superior Concrete Accessories, Inc. Holder adapted for supporting an anchor insert to be embedded in a concrete slab. 4,000,591, Cl. 52-125.000.

Coutarel, Yves, to Intertechnique S.A. Sample conveyors. 4,001,585, Cl. 250-328.000.

Crago, William Arthur, to British Hovercraft Corporation Limited. Air cushion vehicles. 4,000,710, Cl. 114-67.00A.

Cram, Donald J., to University of California, The Regents of the. Asymmetric macrocycles containing oxygen and binaphthyl ring members. 4,001,279, Cl. 260-340.300.

Crenshaw, Ronnie Ray: *See—*
Partyka, Richard Anthony; and Crenshaw, Ronnie Ray, 4,001,237.
Partyka, Richard Anthony; and Crenshaw, Ronnie Ray, 4,001,238.

Crimpfil Limited: *See—*
Holden, Gordon Alan, 4,000,551.

Crinospital S.p.A.: *See—*
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Crockett, James R., Sr. Water alarm switch. 4,001,531, Cl. 200-61.040.

Crompton & Knowles Corporation: *See—*
Nelson, Alden W., 4,000,554.

Cross, Leslie E.: *See—*
Batha, Howard D.; and Cross, Leslie E., 4,001,102.

Crouch, Robert D.: *See—*
Stavropoulos, William S.; and Crouch, Robert D., 4,001,089.

Crull, Anna W.: *See—*
Doyle, Earl N.; and Crull, Anna W., 4,001,180.

Crute, Billy G.; and Evans, John H., to Stant Manufacturing Company, Inc. Gas tank cap with roll-over valving. 4,000,828, Cl. 220-203.000.

Cubic Corporation: *See—*
Watt, Richard E., 4,001,682.

Cubitt, John A.; and Ellwood, Henry, to USM Corporation. Apparatus for drying or cooling particulate material with a gas. 4,000,563, Cl. 34-10.000.

Cull, Neville L.; and Smith, Warren M., to Exxon Research and Engineering Company. Flue gas desulfurization sorbent and process. 4,001,376, Cl. 423-244.000.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Moppett, Charles E.; Cullen, Walter P.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,001,397.

Culpepper, Jerry W., to Texas Instruments Incorporated. Beacon tracking receiver. 4,001,828, Cl. 343-113.00R.

Cummins Engine Company, Inc.: *See—*
Harris, Dallas R., 4,000,725.

Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. Amino ethanol-indane and tetrahydronaphthalene derivatives. 4,001,330, Cl. 260-570.600.

Curry, Kenneth Vasey; and Sahir, Ahamado Ismail, to Lever Brothers Company. Hairdressings. 4,001,392, Cl. 424-47.000.

Curtis Instruments, Inc.: *See—*
Marwell, Edward M.; and Loh, Jack C., 4,001,688.

Cypher, James H., to PPG Industries, Inc. Insulating spandrel glazing unit. 4,000,593, Cl. 52-172.000.

Czech, James I.: *See—*
Schrage, Joy A.; Pielemeier, John William; and Czech, James I., 4,000,968.

Dahlinger, Rodney J., to Hughes Aircraft Company. Bias circuit for a photo-avalanche diode. 4,001,614, Cl. 307-311.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Michizoe, Yoshio; Toyomatsu, Masafumi; and Uchida, Masakatsu, 4,001,368.

Daikeler, Wolfgang; and Deppner, Horst, to Dornier GmbH. Control for the release of a parachute within a towed aircraft. 4,000,867, Cl. 244-1.0TD.

Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; and Huttebraucker, Dag-Harald, 4,000,614.
Worner, Gunter, 4,000,794.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See—*
Ito, Masahiko; Wada, Hiromichi; Kondo, Fumio; and Kai, Fukio, 4,001,035.

Dakota Iron, Inc.: *See—*
Pleis, Duane R., 4,000,552.

Dallimonti, Renzo, to Honeywell Inc. Concurrent overview and detail display system having process control capabilities. 4,001,807, Cl. 340-324.00A.

Danielmeyer, Hans-Gunter; Jeser, Jean Pierre; Kruhler, Walter-Wolfgang; Thiemann, Karl-Heinz; and Huber, Gunter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Laser solar cell apparatus. 4,001,704, Cl. 330-4.300.

Danilewicz, John C.; Evans, Anthony G.; Ham, Allan L.; and Thomson, Colin, to Pfizer Inc. 4-Aminoquinazoline cardiac stimulants. 4,001,422, Cl. 424-251.000.

Dankert, Gerhard: *See—*
Groegler, Gerhard; Dankert, Gerhard; Recker, Klaus; and Backes, Josef, 4,001,232.

Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe active band-pass filter. 4,001,710, Cl. 330-31.000.

Dascalescu, Aurelian M.; and Socolescu, Grigore O., to Uzina De Produse Sodice. Manufacturing process for heavy sodium carbonates in briquette form. 4,001,381, Cl. 423-426.000.

Daspit, Ronald Albert. Tubular clamping and sealing coupler. 4,000,921, Cl. 285-336.000.

Datwyler, George L., to Sperry Rand Corporation. Wire-wrap depth control for hand held wiring gun. 4,000,862, Cl. 242-7.060.

d'Auria, Luigi; Huignard, Jean-Pierre; Reboul, Jean Philippe; and Le Carvennec, Francois, to Thomson-CSF. Electro-optical converter and an optical information recording system comprising such a converter. 4,001,635, Cl. 315-169.00R.

Dave, Bhalchandra Anantray, to Pennwalt Corporation. Package and method for packaging and storing cut leafy vegetables. 4,001,443, Cl. 426-106.000.

Davies, David J., to Western Gear Corporation. Modular system for quick conversion of aircraft passenger compartments to cargo baggage/compartments. 4,000,870, Cl. 244-118.00R.

Davies, William D.: *See—*
Voyles, Gerald A.; and Davies, William D., 4,001,655.

Davis, Allen E.: *See—*
Hall, Kilmer L.; Davis, Allen E.; and Peck, Robert L., 4,001,554.

Davis, Jordan R.: *See—*
Powell, Truman W.; and Davis, Jordan R., 4,001,772.

Davis, Mark A.; Eggenberger, Markus A.; and Kure-Jensen, Jens, to General Electric Company. Testable protective system. 4,001,654, Cl. 317-135.00R.

Davis, Ralph A.: *See—*
Plonka, James H.; and Davis, Ralph A., 4,001,293.

Davis, William J.; and Izbicki, Anthony J. Method for preparing pulverulent polymers exhibiting an apparent increase in glass transition temperature and shaping the resultant polymer materials. 4,001,360, Cl. 264-49.000.

Dawson, Charles R.; and Kostelnicek, Richard J., to Exxon Production Research Company. Method of transmitting signals from a drill bit to the surface. 4,001,774, Cl. 340-18.0LD.

Dawson, William P.: *See—*
Malcolm, Bruce G.; and Dawson, William P., 4,001,736.

Day, Kenneth Edwin. Carburetor. 4,001,355, Cl. 261-44.00R.

Deane, Kenneth E.; Ring, Thomas F.; and Malott, Bernard, to P. R. Mallory & Co., Inc. Timing mechanism. 4,001,528, Cl. 200-38.00R.

Dear, Robert Ernest Arthur; and Falk, Robert Allan, to Ciba-Geigy Corporation. RF-glycols containing two perfluoroalkylthio groups and useful compositions therefrom. 4,001,305, Cl. 260-486.00H.

Decker, Peter: *See—*
Wirz, Burkhardt; Decker, Peter; Gensheimer, Valentin; and Dorn, Alfred, 4,000,692.

Deeble, Ronald Edward: *See—*
Barker, Philip Edwin; and Deeble, Ronald Edward, 4,001,112.

Deering Milliken Research Corporation: *See—*
Wethington, Charles A., 4,001,071.

DeHaai, Kermit M. Airplane fuselage structure. 4,000,871, Cl. 244-119.000.

de Lange, Cor: *See—*
Ostgaard, John T.; Doornbos, James M.; Bartley, John E.; and de Lange, Cor, 4,000,701.

Delikat, Robert P. Audio to video translator. 4,001,880, Cl. 358-81.000.

Delle Ville, Piero: *See—*
Severini, Febo; Tavazzani, Carlo; and Delle Ville, Piero, 4,001,349.

Dellian, Kurt A.; and Isharani, Jayanti V., to Ciba-Geigy Corporation. Dyeing and printing synthetic hydrophobic fibers with a carrier comprising phenyl cyclohexane and derivatives. 4,000,969, Cl. 8-173.000.

Delmon, Bernard; LeMaitre, Jacques; and Bulens, Michel, to UNIBRA. Method for the treatment of clay and products obtained. 4,001,362, Cl. 264-56.000.

Del Pesco, Thomas W., to Du Pont de Nemours, E. I., and Company. Synthesis of aromatic amines by reaction of aromatic compounds with ammonia. 4,001,260, Cl. 260-296.00R.

Demag Aktiengesellschaft: *See—*
Hannover, Hans-Otto; and Spoler, Johannes Gerhard, 4,000,700.
John, Carl, 4,001,051.

Deman, Pierre: *See—*
Buchholtzer, Claude; Deman, Pierre; Drobecq, Michel; and Oger, Pierre, 4,001,511.

De Maria, Carmine. Reclining chair. 4,000,529, Cl. 5-37.00R.

Denaro, Salvatore. Inflatable collapsible tent. 4,000,585, Cl. 52-2.000.

deNeui, Richard P., to Minnesota Mining and Manufacturing Company. Applicator for pressure-sensitive adhesive fasteners. 4,001,072, Cl. 156-461.000.

Dennison Manufacturing Company: *See*—
Geurtsen, Friedrich Henri Herman; and Pichel, Maurice Desire, 4,000,690.

Denny, William Michael; Hagen, Russell Louis; and Leung, Steve Ka-Lai, to Burroughs Corporation. Bar graph digital interface circuit. 4,001,699, Cl. 328-71.000.

Denroche, Charles Henry Pentland: *See*—
Agnew, Kenneth Malcolm; Denroche, Charles Henry Pentland; and Hewlett, Roy, 4,000,951.

Deppner, Horst: *See*—
Daikeler, Wolfgang; and Deppner, Horst, 4,000,867.

Derasp, Roger. Lighting pole. 4,001,573, Cl. 240-64.000.

Derman, Karl Gustaf; and Bohman, Nils-Erik. Shaft sealing and bearing arrangement, especially for propeller shafts. 4,000,933, Cl. 308-237.00R.

Desnoyers, Pierre: *See*—
Malen, Charles; and Desnoyers, Pierre, 4,001,420.

Deubel, Bernard S., to Therm-O-Disc Incorporated. Non-resettable thermostat. 4,001,751, Cl. 337-343.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Turk, Gunter; and Welsch, Joseph, 4,001,379.

Deutsche Texaco Aktiengesellschaft: *See*—
Simic, Dragomir; Zupancic, Heinz-Ulrich; and Cherubim, Martin, 4,001,148.

Deutsche Vergaser GmbH & Co. Kommanditgesellschaft: *See*—
Bockelmann, Wilfried; Grozinger, Hans; and Wobky, Peter Ulrich, 4,000,615.

Deveraux, Harry R.: *See*—
Veeneman, John L.; Thomas, Marion E.; and Deveraux, Harry R., 4,001,451.

Dexter, Martin; and Steinberg, David Herbert, to Ciba-Geigy Corporation. Hindered hydroxyphenylalkanoates of substituted isopropanols. 4,001,299, Cl. 260-473.00S.

Dhein, Rolf: *See*—
Selbeck, Harald; Dhein, Rolf; Rudolph, Hans; Patheiger, Manfred; and Bendszus, Otto, 4,001,348.

Diamond, Julius, to William H. Rorer, Inc. Process for making a methenamine salt of an optically active acid. 4,001,231, Cl. 260-248.500.

Diamond Shamrock Corporation: *See*—
Bluestone, Henry; Scozzie, James A.; and Ignatoski, Joseph A., 4,001,325.

Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; and Baum, Allen J., to Hewlett-Packard Company. General purpose calculator having selective data storage, data conversion and time-keeping capabilities. 4,001,569, Cl. 235-156.000.

Diem, Hans; Libowitzky, Herbert; Matthias, Guenther; Dudeck, Christian; and Lehmann, Gunter, to BASF Aktiengesellschaft. Stabilized aqueous formaldehyde solutions and process for their manufacture. 4,001,337, Cl. 260-606.000.

Diesel Kiki Co., Ltd.: *See*—
Kurokawa, Fuminori, 4,000,728.

Dietrich, Felix; and Honegger, Werner, to Ferag AG. Apparatus for destacking a substantially spiral-shaped formed stack of printed products. 4,000,806, Cl. 198-443.000.

Dietsche, Thomas J., to Dow Chemical Company, The. 1,2,5,8-Tetra hydro-2,4,6,8-tetramethyl-1,5-diazocine-2,8-diol and method of preparation. 4,001,215, Cl. 260-239.0BC.

Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. Drive circuit for a gate semiconductor device. 4,001,607, Cl. 307-252.00C.

Diggs, Richard E. Solar heated and cooled modular building. 4,000,850, Cl. 237-1.00A.

Digicomo, Edward F. Wall mounted hygienic device. 4,000,742, Cl. 128-229.000.

Digital Equipment Corporation: *See*—
Schneider, Guenter E., 4,001,889.

Digital Systems, Inc.: *See*—
Patel, Jayantilal S., 4,000,954.

Dilling, Peter; and Prazak, Gerald, to Westvaco Corporation. Process for making sulfonated lignin surfactants. 4,001,202, Cl. 260-124.00R.

DiMatteo, Paul L., to Dynell Electronics Corporation. Arrangement for generating and constructing three-dimensional surfaces and bodies. 4,001,069, Cl. 156-353.000.

Dimmitt, David L.: *See*—
Gardner, Frank H.; and Dimmitt, David L., 4,000,888.

Dingwall, Andrew Gordon Francis. Electrical circuit. 4,001,606, Cl. 307-251.000.

Dionics, Inc.: *See*—
Kravitz, Bernard L.; and Seaton, George R., 4,001,866.
Kravitz, Bernard L.; and Seaton, George R., 4,001,867.

Director of National Food Research Institute: *See*—
Tsumura, Nobuzo; and Kasumi, Takafumi, 4,001,082.

DiStefano, Thomas H.: *See*—
Baglin, John E.; DiStefano, Thomas H.; and Tu, King-Ning, 4,001,049.

Dittman, Donald Allen; and Rozzi, Francis Armand, to Eastman Kodak Company. Method of multi-layer coating. 4,001,024, Cl. 96-87.00R.

Dix, C. Hewitt: *See*—
Fort, J. Robert; Westphal, James A.; and Dix, C. Hewitt, 4,001,768.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Haese, Egon, 4,001,374.
Pries, Erich, 4,001,092.

Dodds, Dale I. 2-(2-Ethoxy)ethoxyethyl benzimidazolecarbamate. 4,001,423, Cl. 424-273.000.

Dodge, Marlow W.: *See*—
Johnson, Arthur L., Jr.; and Dodge, Marlow W., 4,000,829.

Doerr, Wendell P.; and Janko, George F., to Hoover Ball and Bearing Company. Chair control with front to rear torsion bar. 4,000,925, Cl. 297-304.000.

Dolby Laboratories, Inc.: *See*—
Gundry, Kenneth James, 4,001,732.

Dolejs, Anthony H.: *See*—
Novak, Frank A.; and Dolejs, Anthony H., 4,000,892.

Doll, David W., to General Atomic Company. Control apparatus. 4,001,078, Cl. 176-35.000.

Don R. Hinderliter, Inc.: *See*—
Hixson, Claude M., 4,000,634.

Donald, James E.; and Weigt, Gerald I., to MSE Corporation. Shock absorber. 4,000,912, Cl. 280-701.000.

Donkers, Jacobus M., to N.V. Industriecle Handelscombinatie Holland. Bucket dredger. 4,000,568, Cl. 37-69.000.

Doornbos, James M.: *See*—
Ostgaard, John T.; Doornbos, James M.; Bartley, John E.; and de Lange, Cor, 4,000,701.

Dorn, Alfred: *See*—
Wirz, Burkhardt; Decker, Peter; Gensheimer, Valentin; and Dorn, Alfred, 4,000,692.

Dornier GmbH: *See*—
Daikeler, Wolfgang; and Deppner, Horst, 4,000,867.
Gregor, Peter, 4,000,868.
Tauchmann, Reinhard, 4,000,647.

Dost, Fredy: *See*—
Ottl, Adolf; Dost, Fredy; and Breindl, Otto, 4,000,730.

Dougherty, Steven J.; and Wells, Rex C., to Union Carbide Corporation. Alcohol-rhodium separation process. 4,001,289, Cl. 260-450.000.

Doutrich, Ray Charles; and Fry, Richard Eugene, to Du Pont de Nemours, E. I., and Company. Process for forming a solder band. 4,001,464, Cl. 427-58.000.

Dover, R. Thomas; and Hemmi, Christian O., to Texas Instruments Incorporated. Scanning antenna with extended off broadside scanning capability. 4,001,835, Cl. 343-754.000.

Dow Chemical Company, The: *See*—
Bozzelli, John W.; and Shier, George D., 4,001,107.
Chamberlin, Thomas A.; and Madison, Norman L., 4,001,147.
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Farber, Hugh A., 4,001,310.
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Dow Chemical Corporation: *See*—
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Dowell, Kenneth J., to Smiths Industries Limited. Display systems. 4,001,499, Cl. 358-93.000.

Dower, Ethell J., to Warren Automatic Tool Co. Apparatus for pneumatically monitoring conditions of a well circulating system. 4,000,645, Cl. 73-155.000.

Doyle, Earl N.; and Crull, Anna W. Polyurethane curing agent. 4,001,180, Cl. 260-75.0NH.

Drake, Charles A.; and Marwil, Stanley J., to Phillips Petroleum Company. Method of preparing unsaturated dinitriles. 4,001,294, Cl. 260-465.80R.

Drake, Charles J.; and Farrow, John F., to Kelsey-Hayes Company. Welding monitoring and control system. 4,001,540, Cl. 219-110.000.

Dreikorn, Barry A., to Eli Lilly and Company. Tetrazolo- and triazolobenzothiazines. 4,001,227, Cl. 260-243.00R.

Drews, Reinhold Alvin; and Burgener, Frank Robert, Jr., to Whirlpool Corporation. Receptacle drive coupling for an automatic washer. 4,000,631, Cl. 68-23.700.

Drobecq, Michel: *See*—
Buchholtzer, Claude; Deman, Pierre; Drobecq, Michel; and Oger, Pierre, 4,001,511.

Drop, Peter Cornelis; Endevoets, Willy Joseph Catharina; van Eijl, Antonie Peter Lambertus; and Jack, Alexander Gray, to U.S. Philips Corporation. High pressure tin halide discharge lamp. 4,001,626, Cl. 313-229.000.

Drori, Mordcki. Sprinkler having improved water distribution. 4,000,853, Cl. 239-230.000.

Ducanis, Paul. Noise-absorbing bar stock guide for screw machine. 4,000,797, Cl. 193-38.000.

Ducommun, Joel: *See*—
Lebet, Jean-Pierre; and Ducommun, Joel, 4,001,579.

Dudeck, Christian: *See*—
Diem, Hans; Libowitzky, Herbert; Matthias, Guenther; Dudeck, Christian; and Lehmann, Gunter, 4,001,337.

Duff-Norton Company, Inc.: *See*—
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Duffy, Richard Joseph: *See*—
Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, 4,001,161.

Duis, Jack L. Mail indicator used in conjunction with a mailbox. 4,000,847, Cl. 232-35.000.

Dunegan, Ronald G., to M & J Valve Company. Method and apparatus for eliminating air from liquid flow streams. 4,000,989, Cl. 55-18.000.

Dunigan, Thomas E.; and Sisco, George C., to United States of America, Army. Reaction product of normal lead beta resorcylate and monobasic cupric salicylate. 4,001,287, Cl. 260-435.00R.

Dunkerley, Kenneth: *See—*
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Dunkin' Donuts Incorporated: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
Chu, Victor Fu Hua, 4,001,164.
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Tanikella, Murty S.; and von Susani, Odorich, 4,001,190.

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E. R. Squibb & Sons, Inc.: *See—*
La Via, Anthony Laurence; and Hill, John Anthony, 4,001,455.
Yale, Harry Louis; and Petigara, Ramesh B., 4,001,233.

Eastman Kodak Company: *See—*
Dittman, Donald Allen; and Rozzi, Francis Armand, 4,001,024.
Krutak, James J., Sr.; Haase, Jan R.; and Landholm, Richard A., 4,001,204.

Eastman-Whipstock, Inc.: *See—*
Brumley, Ralph E.; Riordan, Mathew B.; and Bentley, Richard H., 4,000,549.

Eaton Corporation: *See—*
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Chute, Richard, 4,000,609.
Coldren, Chester P., 4,000,681.
Paskert, Joseph H., 4,000,543.

Eberhardt, Mark Edward, Jr., to Hobart Corporation. Microwave oven controls. 4,001,536, Cl. 219-10.55B.

Eberle, William J.: *See—*
Channing, Harry M.; and Eberle, William J., 4,001,066.

Ebihara, Heihachiro; and Sekiya, Fukuo, to Citizen Watch Co., Ltd. Electronic device for monitoring power consumption of an electro-optical display. 4,001,808, Cl. 340-336.000.

Eckebrecht, James Louis: *See—*
Bolton, Frederick Arthur; and Eckebrecht, James Louis, 4,000,796.

Eclipse, Inc.: *See—*
Mandock, Richard F., 4,000,961.

Economy, James; Frechette, Francis J.; and Wohrer, Luis C., to Carborundum Company, The. Flame resistant cloth. 4,001,477, Cl. 428-224.000.

Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 9,10-Secoestrane derivatives and their production. 4,001,302, Cl. 260-479.00R.

Edwards, Allan Kendrick, to International Standard Electric Corporation. Arrangement for testing telecommunication repeaters. 4,001,525, Cl. 179-175.31R.

Edwards, Francis P.; and James, Leo F. Pipe coupler. 4,000,919, Cl. 285-111.000.

Edwards, John A., to Syntex (U.S.A.) Inc. Thiazole cardiovascular agents. 4,001,421, Cl. 424-270.000.

Eftax, Daniel S. P.: *See—*
Brown, Lloyd H.; Eftax, Daniel S. P.; and Kopp, Joseph N., 4,000,770.

Egan, Wayne Jay: *See—*
Bidlack, Richard Henry; Egan, Wayne Jay; and Miller, Steven Gary, 4,001,517.

Egan, William F., to GTE Sylvania Incorporated. Phase lock loop circuit. 4,001,713, Cl. 331-1.00A.

Eggenberger, Markus A.: *See—*
Davis, Mark A.; Eggenberger, Markus A.; and Kure-Jensen, Jens, 4,001,654.

Eibe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Strip deflector unit. 4,000,635, Cl. 72-148.000.

Eikonix Corporation: *See—*
Johnson, Olof C., Jr.; Whitney, Robert E.; and Froehling, Dieter K., 4,001,546.

Eilingsfeld, Heinz: *See—*
Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, 4,001,335.

EIM Electric Co., Ltd.: *See—*
Igisu, Taro, 4,001,053.

Eisenpresser, Marvin L. Snap fastener. 4,000,547, Cl. 24-214.000.

Eisenstein, Albert, to Babcock & Wilcox Company, The. Heat exchanger structure. 4,000,775, Cl. 165-8.000.

Elastin-Werk Aktiengesellschaft: *See—*
Stahlberger, Bruno; and von Dach, Werner, 4,001,442.

Elecompack Company Ltd.: *See—*
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,000,821.

Electro Corporation: *See—*
Wilson, Michael A.; Gee, Gordon E.; and Momparler, Fred J., 4,001,718.

Electro Switch Corporation: *See—*
MacLean, Alexander, 4,001,740.

Electroglas, Inc.: *See—*
Roch, Jacques Leon, 4,001,685.

Electroprint, Inc.: *See—*
Maddox, Ronnie Joseph, 4,001,838.

Elektriska Svetsningsaktiebolaget: *See—*
Linden, Sven-Erik; and Forsberg, Nils Gunnar Krister, 4,000,606.

Eli Lilly and Company: *See—*
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Elkem-Spigerverket: *See—*
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Ellin, Seymour, to Polaroid Corporation. Photographic control system with evaluation control. 4,001,843, Cl. 354-23.00D.

Ellis, Daniel A., to Mueller Co. Means for locking replaceable nozzles to fire hydrants. 4,000,753, Cl. 137-296.000.

Ellwood, Henry: *See—*
Cubitt, John A.; and Ellwood, Henry, 4,000,563.

Elmore, Dan E.: *See—*
Trocciola, John C.; Elmore, Dan E.; and Stosak, Ronald J., 4,001,042.

Elmore, Glenn V.; and Tanner, Howard A., to Leesona Corporation. Electrochemical cell with alkali and alkaline earth metal containing electrolyte. 4,001,039, Cl. 429-46.000.

Elscint Ltd.: *See—*
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Elsner, Norbert Bernard, to General Atomic Company. Radioactive heat source and method of making same. 4,001,588, Cl. 250-493.000.

Emerson Electric Co.: *See—*
Boggs, Alben C.; and Shirey, Robert D., 4,001,547.
Plasko, Emil Robert, 4,001,754.

Emery, Anthony. Produce container. 4,000,827, Cl. 220-4.00F.

Endevoets, Willy Joseph Catharina: *See—*
Drop, Peter Cornelis; Endevoets, Willy Joseph Catharina; van Eijl, Antonie Peter Lambertus; and Jack, Alexander Gray, 4,001,626.

Endriz, John Guiry; and Catanese, Carmen Anthony, to RCA Corporation. Modulation mask for an image display device. 4,001,619, Cl. 313-105.00R.

Endriz, John Guiry, to RCA Corporation. Modulation mask for an image display device. 4,001,620, Cl. 313-105.00R.

Energetics Science, Inc.: *See—*
Blurton, Keith F.; and Sedlak, John M., 4,001,103.

Energy Development Associates: *See—*
Berman, Alby M.; Walker, Richard C.; and Aller, David J., 4,001,036.

Engel, Edward: *See—*
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Engelskirchen, Konrad; and Galinke, Joachim, to Henkel & Cie G.m.b.H. Process for manufacturing cellulose containing 2,3-dihydroxypropyl ether groups. 4,001,210, Cl. 536-84.000.

Engen, Glenn F.: *See—*
Hoer, Cletus A.; and Engen, Glenn F., 4,001,681.

England, David C.; and Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Process for the preparation of carbacyl halosulfates. 4,001,319, Cl. 260-545.00R.

Engleman, Frank A., Jr.: *See—*
Cook, Albert M.; Engleman, Frank A., Jr.; and Simes, James G., 4,001,700.

Enoguchi, Yuji: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.

Enokido, Tsuneo: *See—*
Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, 4,001,007.

Entrikin, Donald W.: *See—*
Cerniway, Leon A.; and Entrikin, Donald W., 4,000,534.

Enzmann, Siegmund J. Apparatus for separating foreign solid particles from a liquid. 4,001,118, Cl. 210-187.000.

Epstein, Arnold S.: *See—*
Groves, Warren O.; and Epstein, Arnold S., 4,001,056.

Equipements de Machines-Outils Spemo: *See—*
Pascor, Michel, 4,000,907.

Erikson, Ernst G.; and Lindstrom, K. Hakan. Boat hull construction. 4,000,712, Cl. 114-77.00R.

Ermili, Aldo: *See—*
Passerini, Norina; Ermili, Aldo; Roma, Giorgio; Balbi, Alessandro; and Mazzei, Mauro, 4,001,424.

Ernst, Adrian J.: *See—*
Heath, Harley D.; Hofreiter, Bernard T.; and Ernst, Adrian J., 4,001,032.

Ernst Leitz G.m.b.H.: *See—*
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Ershova, Zinaida Fedorovna: *See—*
Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.

Escher Wyss Limited: *See—*
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Esper, Michael J.; Green, Wells L.; Merchant, Stanley R.; and Wells, Charles M., to Ford Motor Company. Stoichiometric air/fuel ratio exhaust gas sensor. 4,001,758, Cl. 338-34.000.

Evans, Anthony G.: *See—*
Danilewicz, John C.; Evans, Anthony G.; Ham, Allan L.; and Thomson, Colin, 4,001,422.

Evans, John H., to Stant Manufacturing Company, Inc. Locking gas cap with torque override feature. 4,000,633, Cl. 70-165.000.

Evans, John H.: *See—*
Crute, Billy G.; and Evans, John H., 4,000,828.

Evans, Raleigh Winslow. Tennis racket weight holder and method of use. 4,000,893, Cl. 273-29.00A.

Evrenidis, Paul: *See—*
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Excoa, Inc.: *See—*
Friant, James E.; Bruton, William J.; Bertelsen, Viggo C., Jr.; and Yates, Patrick A., 4,000,696.

Exxon Production Research Company: *See—*
Dawson, Charles R.; and Kostelnicek, Richard J., 4,001,774.
Holland, Warren E.; and Burrell, George R., 4,001,764.
Stovall, Leland F., 4,000,618.

Exxon Research and Engineering Company: *See—*
Cull, Neville L.; and Smith, Warren M., 4,001,376.
Geissler, Paul R.; and Cahn, Robert P., 4,001,111.
Johnson, Burnett H.; and Huff, Terrence, 4,000,967.
Li, Norman N.; Hucal, Taras; and Cahn, Robert P., 4,001,109.
Longo, John M., 4,001,375.
Steinkamp, Robert A.; and Grail, Thomas J., 4,001,172.

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Fahrbach, Gerhard; Seiler, Erhard; and Gerberding, Karl, to BASF Aktiengesellschaft. Block and graft copolymers. 4,001,350, Cl. 260-880.00B.

Faiveley S.A.: *See—*
Monot, Bernard, 4,000,582.

Falckenberg, Richard, to Siemens Aktiengesellschaft. Apparatus for producing monocrystals by the Verneuil technique. 4,000,977, Cl. 23-273.00V.

Fales, Douglas I., to General Motors Corporation. Solid state thermistor switch. 4,001,802, Cl. 340-244.00A.

Falk, Robert Allan: *See—*
Dear, Robert Ernest Arthur; and Falk, Robert Allan, 4,001,305.

Famolare, Inc.: *See—*
Famolare, Joseph P., Jr., 4,000,566.

Famolare, Joseph P., Jr., to Famolare, Inc. Shock absorbing athletic shoe with air cooled insole. 4,000,566, Cl. 36-28.000.

Farber, Hugh A., to Dow Chemical Company, The. Polyethers having oxidized thioether side chains. 4,001,310, Cl. 260-501.150.

Faris, Edwin E.: *See—*
Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., 4,001,848.

Farrow, John F.: *See—*
Drake, Charles J.; and Farrow, John F., 4,001,540.

Fasciati, Alfred: *See—*
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Buehler, Arthur; Fasciati, Alfred; and Hoelzle, Gerd, 4,001,205.

Fassman, Arnold: *See—*
Calderazzo, Franklin J.; and Fassman, Arnold, 4,000,890.
Mol, Hans C.; Byrne, Leroy H.; and Fassman, Arnold, 4,000,889.

Faubl, Hermann, to Pfizer Inc. Preparation of α-6-deoxytetracyclines. 4,001,321, Cl. 260-559.0AT.

Fawkes, David Melville: *See—*
Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, 4,000,970.

Federal Pioneer Electric Limited: *See—*
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Hazleton, Herbert T., 4,001,753.

Feinstone, Wolffe Harry; and Bandelin, Fred J., to Plough, Inc. Means for depositing aerosol sprays in buttery form. 4,001,391, Cl. 424-45.000.

Felder, Ernst; and Pitre, David E., to Savac AG. Water-soluble, non-ionizing hydroxy-containing amide derivatives of 2,4,6-triiodo-isophthalic acid. 4,001,323, Cl. 260-559.00A.

Feldman, Ilya Afanasievich: *See—*
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich, 4,001,522.
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich, 4,001,523.

Feldmann, Hugo: *See—*
Beerens, Hugo; Feldmann, Hugo; and Schlanzke, Claus Georg, 4,000,625.

Fenwick, Robert B.; and Gilliland, Clinton R., to Barry Research Corporation. Time diversity data transmission apparatus. 4,001,692, Cl. 325-38.00R.

Ferag AG: *See—*
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Ferranti, Limited: *See—*
Grundy, David Latham; and Thompson, John, 4,001,694.
Levis, Peter Stanley; and Shepherd, Geoffrey, 4,001,555.

Ferrozzi, Claudio, to AMF Incorporated. Folder. 4,000,599, Cl. 53-378.000.

Feuer, Laszlo, to Chinoin Pharmaceutical and Chemical Works Ltd. Hormonal product extracted from parathyroid gland and process for the preparation thereof. 4,001,396, Cl. 424-112.000.

Fierst, Jeannette I. Panty girdle construction. 4,000,746, Cl. 128-526.000.

Fildan, Gerhard. Clasp. 4,000,544, Cl. 24-201.0CF.

Fildes, Francis James Thomas, to Imperial Chemical Industries Limited. Slow release biologically active materials for feeding to ruminant animals. 4,001,389, Cl. 424-19.000.

Fink, Richard: *See—*
Jemison, William; Orlando, Salvatore; and Fink, Richard, 4,000,875.

Finkelston, Robert J., to Standard Pressed Steel Co. Tightening system with quality control apparatus. 4,000,782, Cl. 173-12.000.

Finley, Richard James; and Nauman, Warren David, to AMP Incorporated. Wiring device with removable finger portion. 4,000,874, Cl. 248-27.100.

Finucane, Thomas P.; Kovacic, Theodore J.; and Wisler, John R., to General Foods Corporation. Beverage mix and method of manufacturing same. 4,001,448, Cl. 426-285.000.

Fiori, Anthony M.; Fiori, Robert T.; and Nicholas, Thomas C., III, to Spectra-Vision Corporation. Magnetic tape editing, previewing and animating method and system. 4,001,882, Cl. 360-14.000.

Fiori, Robert T.: *See—*
Fiori, Anthony M.; Fiori, Robert T.; and Nicholas, Thomas C., III, 4,001,882.

Fischer, Adolf; Hansen, Hanspeter; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Azetidinyl carbothiolates. 4,001,217, Cl. 260-239.00A.

Fischer, Adolf; Hansen, Hanspeter; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Sulfites of aromatic glycolic amides. 4,001,292, Cl. 260-456.0NS.

Fischer, Hartmut: *See—*
Reske, Eckart; Brinkmann, Ludwig; Fischer, Hartmut; and Rohrscheid, Freimund, 4,001,192.

Fischer, Hermann, to Maschinenfabrik Augsburg-Nurnberg AG. Rotary printing press with improved inking system. 4,000,691, Cl. 101-136.000.

Fischman, Martin; and L'Hommedieu, Jesse H., to GTE Sylvania Incorporated. Horizontal deflection system. 4,001,641, Cl. 315-408.000.

Fisher, William Bernard; Helmer, Howard Lyle; and Pendlebury, David, to Allied Chemical Corporation. Testing and correcting metering accuracy of multihole spinnerets. 4,001,359, Cl. 264-40.100.

Fisons Limited: *See—*
Gates, Peter Stuart, 4,001,003.

Fleetwood Systems, Inc.: *See—*
Mojden, Wallace W., 4,000,709.

Fleetwood, William, to Leesona Plastics Machinery Ltd. Method and apparatus for noise suppression. 4,000,670, Cl. 83-42.000.

Float: *See—*
Busco, Francis J., 4,000,749.

Flores, Raul, to Lawrence Peska Associates, Inc., a part interest. Ring puzzle. 4,000,901, Cl. 273-158.000.

Floyd, F. Louis, to SCM Corporation. Process for polymerizing metallocenes. 4,001,194, Cl. 526-240.000.

Fogel, Arnold W.; and Mercurio, Anthony F., to American Cyanamid Company. Shampoo creme rinse containing a quaternary ammonium saccharinate, cyclamate or phthalimidate. 4,001,394, Cl. 424-70.000.

Folchi, George A.; Wang, Sherman S.; Will, Peter M.; and Zloof, Moshe M., to International Business Machines Corporation. Computer controlled pneumatic retractable search sensor. 4,001,556, Cl. 235-151.000.

Folsom, David A., to QSI Systems, Inc. Switched video recording system. 4,001,881, Cl. 360-5.000.

Fontana, Serge Robert: *See—*
Charransol, Pierre; Hauri, Jacques; and Fontana, Serge Robert, 4,001,781.

Ford, Andrew George; and Hudson, Ronald Augustus, to Imperial Chemical Industries Limited. Method of packaging carbonated beverages in flexible containers. 4,001,450, Cl. 426-410.000.

Ford, John R., to Vernay Laboratories, Inc. Marine muffler. 4,000,786, Cl. 181-52.000.

Ford Motor Company: *See—*
Esper, Michael J.; Green, Wells L.; Merchant, Stanley R.; and Wells, Charles M., 4,001,758.

Foreman, Robert W.: *See—*
Justice, Timothy R.; and Foreman, Robert W., 4,001,038.

Foris, Peter L.; Brown, Robert W.; and Phillips, Paul S., Jr., to NCR Corporation. Capsule manufacture. 4,001,140, Cl. 252-316.000.

Formica International Limited: *See—*
Shaul, Anthony James; and Wood, Edward Russell, 4,001,466.

Formoy, Alec James, to Vickers Limited. Plate processing machines. 4,001,854, Cl. 354-318.000.

Forsberg, Nils Gunnar Krister: *See—*
Linden, Sven-Erik; and Forsberg, Nils Gunnar Krister, 4,000,606.

Fort, J. Robert; Westphal, James A.; and Dix, C. Hewitt, to Geophysical Systems Corporation. Data acquisition, transport and storage system. 4,001,768, Cl. 340-15.5FC.

Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., to Geophysical Systems Corporation. Data array network system. 4,001,769, Cl. 340-15.5TS.
Fortescue, Peter, to General Atomic Company. Insulation structure for pressure vessel cavity. 4,000,595, Cl. 52-302.000.
Fortescue, Peter, to General Atomic Company. Closed cycle gas turbine system. 4,000,617, Cl. 60-644.000.
Foster Grant Co., Inc.: *See—*
Leblanc, Conrad L., 4,000,810.
Foster-Miller Associates, Inc.: *See—*
Hug, Hans Albert, 4,000,783.
Fowler, Albert Lewis, to Hughes Microelectronics Limited. Ignition arrangements for internal combustion engines. 4,000,724, Cl. 123-117.00R.
Fraioli, Anthony V., to Plessey Incorporated. Thick film sensor and infrared detector. 4,001,586, Cl. 250-345.000.
Franchi, Adriano; and Brandani, Paolo, to Axis S.p.A. Control systems for welding machines. 4,001,539, Cl. 219-110.000.
Franklin, Charles H.: *See—*
Geen, Henry C.; Vinton, Clarence S.; and Franklin, Charles H., 4,001,110.
Franks, Jeffrey L., to Gentex Company. Smoke detecting device. 4,001,800, Cl. 340-237.00S.
Fraser, Lawrence J., to Xerox Corporation. Photoreceptor for electrostatic reproduction machines with built-in electrode. 4,000,944, Cl. 355-14.000.
Fratelli Pagnoni S.p.A.: *See—*
Pagnoni, Franco, 4,001,074.
Frechette, Francis J.: *See—*
Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 4,001,477.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane imines. 4,001,326, Cl. 260-566.00R.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane. 4,001,331, Cl. 260-571.000.
Freeman, Peter A., to United States of America, Navy. High gain fluid amplifier. 4,000,757, Cl. 137-834.000.
Freitag, Dieter; Haberland, Ulrich; and Krimm, Heinrich, to Bayer Aktiengesellschaft. Tetraphenol containing polycarbonates. 4,001,183, Cl. 260-47.0XA.
French, Grace Allson. Lid for a cooking utensil. 4,000,830, Cl. 220-369.000.
Frenk, Helmuth, to Ernst Leitz G.m.b.H. Oscillator for non-sinusoidal movements. 4,001,658, Cl. 318-37.000.
Friant, James E.; Bruton, William J.; Bertelsen, Viggo C., Jr.; and Yates, Patrick A., to Excoa, Inc. Cartridge for two component field mixed explosive. 4,000,696, Cl. 102-24.00R.
Fried, John H.; and Harrison, Ian T., to Syntex Corporation. 6-Substituted 2-naphthyl acetic acid derivatives. 4,001,301, Cl. 260-473.00F.
Fried, John H.: *See—*
Muchowki, Joseph M.; and Fried, John H., 4,001,295.
Friedman, Henry, to Eli Lilly and Company. 3-(5-Nitroimidazol-2-yl)pyrazolo[3,4-d]pyrimidine compounds. 4,001,230, Cl. 260-247.5DP.
Friedrich Kocks, Firma: *See—*
Gerhards, Hans-Dieter; and Moltner, Hermann, 4,000,637.
Fritts, David H. Current measuring shunt. 4,001,684, Cl. 324-126.000.
Froehling, Dieter K.: *See—*
Johnson, Olof C., Jr.; Whitney, Robert E.; and Froehling, Dieter K., 4,001,546.
Frost, Rodney I.; Lachman, Irwin M.; and Rieth, Paul H., to Corning Glass Works. Method of preparing crack-free monolithic polycrystalline cordierite substrates. 4,001,028, Cl. 106-62.000.
Fry, Richard Eugene: *See—*
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Fuhrer, Jack Selig: *See—*
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Fuji Photo Film Co., Ltd.: *See—*
Akimoto, Taizo; Terasita, Takaaki; and Watanabe, Shigeru, 4,001,594.
Fujita, Susumu, 4,001,850.
Hayashi, Jun; Sato, Akira; and Shishido, Tadao, 4,001,020.
Ikechi, Masai; and Kusano, Kuniyuki, 4,001,857.
Kondo, Toshihiro, 4,001,851.
Fuji Xerox Co., Ltd.: *See—*
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Fujii, Hisashi: *See—*
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Fujimoto, Yasuo: *See—*
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Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, to Takeda Chemical Industries, Ltd. Novel polypeptides useful for treating diabetes and hypercholesteremia. 4,001,199, Cl. 260-112.50R.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Harada, Hirokichi, 4,001,225.
Umio, Suminori; Ueda, Ikuo; Matsuo, Masaaki; Kobayashi, Masakazu; Nakaguti, Osamu; and Sato, Yoshinari, 4,001,280.
Fujita, Masatoshi: *See—*
Fukumoto, Ryoichi; and Fujita, Masatoshi, 4,000,581.
Fujita, Susumu, to Fuji Photo Film Co., Ltd. Data recording camera. 4,001,850, Cl. 354-219.000.
Fujiwara, Akinori: *See—*
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Fujiwara, Minoru: *See—*
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Fujiwara, Takao: *See—*
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Fujiwara, Yoshio: *See—*
Hamana, Isao; Fujiwara, Yoshio; and Kumakawa, Shiro, 4,001,479.
Fukata, Yasuo; and Hatsumi, Ryoichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Signal identification system. 4,001,521, Cl. 179-84.0VF.
Fukatsu, Shunzo: *See—*
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,001,208.
Fukaya, Hirokazu, to Nippon Electric Company, Ltd. Vertical deflection circuit for television receiver set. 4,001,715, Cl. 331-20.000.
Fukuda, Masataro; Iwaki, Tsutomu; and Kobayashi, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Fuel cell. 4,001,040, Cl. 429-15.000.
Fukuda, Minoru, to Hitachi, Ltd. Field effect transistor Miller integrator oscillator with temperature compensating impedance. 4,001,721, Cl. 331-111.000.
Fukui, Kiyotake; and Ninomiya, Shuichi, to Matsushita Electric Industrial Co., Ltd. Display device including circuits for driving loads such as electrophoretic displays. 4,001,809, Cl. 340-336.000.
Fukumoto, Akiharu; and La Force, Phil D., to United States of America, Navy. Dual mode fluid management system. 4,000,613, Cl. 60-251.000.
Fukumoto, Ryoichi; and Fujita, Masatoshi, to Aisin Seiki Kabushiki Kaisha. Vehicle window regulator mechanism. 4,000,581, Cl. 49-103.000.
Fukuoka, Masaru: *See—*
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Funatani, Kiyoshi; Ozaki, Ryosuke; and Mizuno, Kazuhiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for fixing a bearing cup in a Hooke's type universal joint. 4,000,628, Cl. 64-17.00A.
Furuhashi, Michio: *See—*
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Furuhata, Yoshio: *See—*
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Futamase, Tsuyoshi; and Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,000,675, Cl. 84-1.010.
Fuzimura, Susumu: *See—*
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G. D. Searle & Co.: *See—*
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Yonan, Peter K., 4,001,244.
Gable, Howard S.; and Kerr, Glenn W., to Gable, Howard S. Magnetic organo-iron compounds. 4,001,288, Cl. 260-439.00R.
Gaillard, Jean; and Lassau, Christian, to Institut Francais du Petrole. Process for manufacturing dicyclohexanol propane by hydrogenating diphenol propane. 4,001,343, Cl. 260-631.00H.
Galinke, Joachim: *See—*
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Gall, Kurt. Rotating auger arrangement for pumping processing fluid through a film developing container. 4,001,852, Cl. 354-313.000.
Gall, Martin, to Upjohn Company, The. Process for the production of 1-[(dimethylamino)methyl]-6-phenyl-4H-imidazo[1,2-a][1,4]-benzodiazepine. 4,001,261, Cl. 260-296.00T.
Gall, Martin, to Upjohn Company, The. The process for the production of 1-[(dimethylamino)methyl]-6-phenyl-4H-triazolo[4,3-a][1,4]-benzodiazepine. 4,001,262, Cl. 260-296.00T.
Galt, Ronald Hilson Begg; and Young, Edwin Harry Paterson, to Imperial Chemical Industries Limited. 1'-Substituted-thioxanthene-9-spiro-4'-piperidine derivatives and the 10-oxides and 10,10-dioxides thereof. 4,001,418, Cl. 424-267.000.
Galt, Ronald Hilson Begg; and Pearce, Robert James, to Imperial Chemical Industries Limited. 1'-Substituted xanthene-9-spiro-4'-piperidine derivatives. 4,001,419, Cl. 424-267.000.
Galzy, Pierre: *See—*
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Gamble, John G., to Veeder Industries, Inc. Rotary electromagnetic indicator. 4,001,815, Cl. 340-373.000.
Gannon, Peter F., to Vinyl-Fab Industries, Inc. Swimming pool cover floating support. 4,000,527, Cl. 4-172.120.
Gardner, Frank H.; and Dimmitt, David L. Web severing device. 4,000,888, Cl. 270-21.000.
Garmaise, David Lyon: *See—*
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Garrett Corporation, The: *See—*
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Gaskins, Jack C., to Batson-Cook Company. Controlled tension let-off for unwinding rolls of material. 4,000,865, Cl. 242-75.430.
Gaskins, Thomas. Liquid applying means. 4,000,971, Cl. 21-63.000.
Gates, Paul E.: *See—*
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Gates, Peter Stuart, to Fisons Limited. Plant physiologically active compositions containing 2-halo-2,3-dihydrobenzofuran-5-olesters of sulfonic acids and methods of use. 4,001,003, Cl. 71-88.000.
Gates Rubber Company, The: *See—*
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Gaussens, Gilbert: *See—*
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Gee, Gordon E.: *See—*
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Geen, Henry C.; Vinton, Clarence S.; and Franklin, Charles H., to Chemotronics International, Inc. Method for the thermal treatment of tubular dialysis units and improved units resulting therefrom. 4,001,110, Cl. 210-22.00A.
Gehlhaus, Paul H.: *See—*
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Geissler, Paul R.; and Cahn, Robert P., to Exxon Research and Engineering Company. Dual temperature gradient elution liquid chromatography. 4,001,111, Cl. 210-24.000.
Gelman, Charles; and Vadnay, Attila, to Gelman Instrument Company. Water filter device. 4,001,120, Cl. 210-420.000.
Gelman Instrument Company: *See—*
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Boah, John K., 4,001,047.
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Chambers, George S.; and Lane, L. Jubin, 4,001,712.
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Klein, Keith W.; and Palmieri, Joseph M., 4,001,652.
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Gerberding, Karl: *See—*
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Gerhards, Hans-Dieter; and Moltner, Hermann, to Friedrich Kocks, Firma. Rolling mills. 4,000,637, Cl. 72-226.000.
Germond, Jean-Claude; Le Mouee, Theodore; Marchal, Paul; Petit, Michel; and Vertut, Jean, to Commissariat a l'Energie Atomique. Control arm for a power manipulator. 4,000,819, Cl. 214-1.0CM.
Gerster, John F., to Riker Laboratories, Inc. Substituted benzo(ij)-quinolizine-2-carboxylic acids and derivatives thereof. 4,001,243, Cl. 260-287.00P.
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Geurtsen, Friedrich Henri Herman; and Pichel, Maurice Desire, to Dennison Manufacturing Company. Printing coder. 4,000,690, Cl. 101-36.000.
Geyer, Robert P., to Standard Car Truck Co. Railway car center plate and auxiliary resilient bearings. 4,000,931, Cl. 308-138.000.
Gibbons, James F. Semiconductor p-n junction solar cell and method of manufacture. 4,001,864, Cl. 357-30.000.
Gibson, Gordon L., to TWM Manufacturing Company, Inc. Lightweight high strength auxiliary lift axle suspension system for high framed vehicles. 4,000,913, Cl. 280-704.000.
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Gifford, Phillip H., II. Hydrocracking process for the production of synthetic fuels. 4,001,105, Cl. 208-11.00R.
Gilbert, Seymour, to Dunkin' Donuts Incorporated. Pressure relief valve and bag incorporating same. 4,000,846, Cl. 229-62.500.
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Givaudan Corporation: *See—*
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Glicksman, Martin; and Wankier, Bartley N., to General Foods Corporation. Low calorie sweetening composition and method for making same. 4,001,456, Cl. 426-548.000.
Globe Tool and Engineering Company, The: *See—*
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Gloge, Detlef Christoph, to Bell Telephone Laboratories, Incorporated. Optical fiber jacket designs for minimum distortion loss. 4,000,936, Cl. 350-96.0WG.
Glory Kogyo Kabushiki Kaisha: *See—*
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Goddard, Stephen A. A. Lamp shade. 4,001,576, Cl. 240-108.00B.
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Golbe, Alvin V. Sound activated alarm system. 4,001,805, Cl. 340-280.000.
Goldberg, Edward M. Electrical leads for cardiac stimulators and related methods and means. 4,000,745, Cl. 128-418.000.
Goldie, Harry, to United States of America, Air Force. High average power millimeter duplexer. 4,001,829, Cl. 343-180.000.
Gooding, David N.; and Shimp, Everett M., to International Business Machines Corporation. Arithmetic unit for a digital data processor. 4,001,570, Cl. 235-174.000.
Goodman, Roger John, to Honeywell Inc. Intrusion detection transducer. 4,001,745, Cl. 336-20.000.
Goodyear Aerospace Corporation: *See—*
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Gornall, Victor Joseph. Animated clacker. 4,000,579, Cl. 46-154.000.

Gorton, Earl M.; and Kline, Robert W., to PPG Industries, Inc. Distillation of methylchloroform. 4,001,345, Cl. 260-652.00P.

Gotham, Stanley T., to Leesona Corporation. Size reduction apparatus. 4,000,860, Cl. 241-242.000.

Goto, Motoo; Fujiwara, Minoru; and Ishikawa, Makoto, to Onahama Seiren Kabushiki Kaisha. Method of operating copper ore smelting reverberatory furnace. 4,001,013, Cl. 75-72.000.

Goust, Jean Michel; and Moulias, Robert Louis, to Piktor Limited. Production of immunological materials. 4,001,080, Cl. 195-1.800.

Graafsma, Richard S., to Auto Specialties Manufacturing Company. Screw jack. 4,000,880, Cl. 254-103.000.

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Graff, Albert L. Electric power generating system. 4,001,597, Cl. 290-53.000.

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Graham, Wilson E. Load-bearing wall panel whose elements are mortar-binded, and apparatus and method for fabricating same. 4,001,365, Cl. 264-69.000.

Grail, Thomas J.: *See—*
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Granatek, Alphonse Peter; and Kaplan, Murray Arthur, to Bristol-Myers Company. Injectable formulations of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid. 4,001,409, Cl. 424-246.000.

Grant, David C., Jr., to United Technologies Corporation. Optical readout for differential laser gyros. 4,000,947, Cl. 356-106.0LR.

Grant, Richard F., to Poly-Choke Company, Incorporated, The. Rib for handgun. 4,000,574, Cl. 42-1.00S.

Granzer, Ernold: *See—*
Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, 4,001,431.

Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., to Standard Oil Company. Process for the oxidation of olefins using catalysts containing various promoter elements. 4,001,317, Cl. 260-533.00N.

Graul, Juergen; and Murrmann, Helmuth, to Siemens Aktiengesellschaft. Process for producing semiconductor devices. 4,001,465, Cl. 148-187.000.

Gray, George W., to Lutron Electronics Co., Inc. Lamp ballast. 4,001,637, Cl. 315-205.000.

Gray, Laverne E.: *See—*
Hardison, Jerry C.; and Gray, Laverne E., 4,000,811.

Gray, Roy A.: *See—*
Murtha, Timothy P.; and Gray, Roy A., 4,001,182.

Graybill, Clinton. Variable venturi downdraft carburetor. 4,001,356, Cl. 261-144.000.

Great Lakes Carbon Corporation: *See—*
Harvey, Jay A., 4,001,469.

Grebe, Ludwig; and Grebe, Reiner, to Kraemer & Grebe GmbH & Co KG Maschinen- und Modellfabrik. Vacuum food mill. 4,000,861, Cl. 241-282.100.

Grebe, Reiner: *See—*
Grebe, Ludwig; and Grebe, Reiner, 4,000,861.

Green, Booker. Invalid handling device. 4,000,530, Cl. 5-87.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Method of inhibiting the growth of bacteria by the application thereto of capped polymers. 4,001,432, Cl. 424-329.000.

Green, Wells L.: *See—*
Esper, Michael J.; Green, Wells L.; Merchant, Stanley R.; and Wells, Charles M., 4,001,758.

Greenhaigh, Colin William: *See—*
Cheetham, Ian; Dunkerley, Kenneth; Greenhaigh, Colin William; Moyse, James Albert; and Newton, David Francis, 4,001,169.

Gregor, Peter, to Dornier GmbH. Deflector blade of variable camber. 4,000,868, Cl. 244-12.500.

Grenfell, K. Pascoe, to General Electric Company. Load peak shaver power regulating system. 4,001,666, Cl. 322-4.000.

Gries, Heinz; and Pfeiffer, Heinrich, to Schering Aktiengesellschaft. Triiodized N-methyldicarboxylic acid anilides. 4,001,298, Cl. 260-471.00R.

Grieve, Donald F.: *See—*
Melin, Deering D., Jr.; and Grieve, Donald F., 4,000,991.

Griffin, Charles E., Jr., to Burlington Industries, Inc. Shipping pallet. 4,000,704, Cl. 108-53.100.

Griffin, Floyd S., to Ordnance Research, Inc. Time delay circuit. 4,001,610, Cl. 307-293.000.

Griffin, Richard J., to Telan Corporation. Method and device for separating blood components. 4,001,122, Cl. 210-516.000.

Grinev, Mikhail Petrovich: *See—*
Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.

Groegler, Gerhard; Dankert, Gerhard; Recker, Klaus; and Backes, Josef, to Bayer Aktiengesellschaft. Process for preparing 1-substituted 2-methyl-tetrahydropyrimidines. 4,001,232, Cl. 260-251.00R.

Groenendaal, Willem: *See—*
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Groenig, Robert E. Vehicle for picking fruit. 4,000,787, Cl. 182-2.000.

Grosick, Herbert A., to Koppers Company, Inc. Method for the removal of naphthalene from coke oven gas. 4,001,347, Cl. 260-674.00N.

Gross, Franz, to Siemens Aktiengesellschaft. Selectively damped travelling wave tube. 4,001,630, Cl. 315-3.500.

Grossi, Galeazzo: *See—*
Bove, Ottavio; Grossi, Galeazzo; and Kirkley, David William, 4,001,543.

Grovenstein, Lewis F., Jr.: *See—*
Hrbacek, Benny A.; and Grovenstein, Lewis F., Jr., 4,001,695.

Groves, Warren O.; and Epstein, Arnold S., to Monsanto Company. Epitaxial deposition of III-V compounds containing isoelectronic impurities. 4,001,056, Cl. 148-175.000.

Grozinger, Hans: *See—*
Bockelmann, Wilfried; Grozinger, Hans; and Wobky, Peter Ulrich, 4,000,615.

Gruenberg, Elliot L. Communications relay system. 4,001,691, Cl. 325-14.000.

Grundy, David Latham; and Thompson, John, to Ferranti, Limited. Automatic gain control circuit arrangements having a plurality of stages of amplification. 4,001,694, Cl. 325-319.000.

Grundy, Reed H., to Westinghouse Air Brake Company. Advance train line register for a train speed regulation system. 4,000,872, Cl. 246-182.00R.

GTE Laboratories Incorporated: *See—*
Haugsjaa, Paul Osborne; and Regan, Robert James, 4,001,632.
McNeill, William; Lech, Joseph; Haugsjaa, Paul; and Regan, Robert, 4,001,631.
Robinson, Lawrence B.; and Powazinik, William, 4,001,076.

GTE Sylvania Incorporated: *See—*
Cosco, Robert J.; Hebert, Roger T.; and Gates, Paul E., 4,001,624.
Egan, William F., 4,001,713.
Fischman, Martin; and L'Hommedieu, Jesse H., 4,001,641.

Guldin, David R., to Westinghouse Air Brake Company. Brake shoe and head assembly. 4,000,792, Cl. 188-242.000.

Gundisch, Gusztav: *See—*
Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.

Gundry, Kenneth James, to Dolby Laboratories, Inc. Calibration oscillators for noise reduction systems. 4,001,732, Cl. 333-14.000.

Gunther, Dieter; Nestler, Hans Jurgen; Rosch, Gunter; and Schinzel, Erich, to Hoechst Aktiengesellschaft. 4-Stilbenyl-5-cyano-1,2,3-triazoles. 4,001,221, Cl. 260-240.00C.

Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., to M & T Chemicals Inc. Method for permanently and uniformly incorporating an additive into an undrawn fiber. 4,001,367, Cl. 264-154.000.

Gutjahr, Gert. Electric shaver. 4,000,560, Cl. 30-41.600.

Gutzwiller, Ernst: *See—*
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Gyugyi, Laszlo; Rosa, John; and Stacey, Eric J., to Westinghouse Electric Corporation. Static reactive power generating apparatus. 4,001,670, Cl. 323-108.000.

Gyugyi, Laszlo; Brennen, Michael B.; and Stacey, Eric J., to Westinghouse Electric Corporation. Apparatus for providing feedback to eliminate a DC component in the output of a static VAR generator. 4,001,671, Cl. 323-119.000.

H. Koch & Sons, Inc.: *See—*
Poehlmann, Paul W., 4,000,917.

Haas, Edgar; and Kottsieper, Edward, to Herman Schwabe, Inc. Die press control apparatus. 4,001,645, Cl. 318-17.000.

Haase, Jan R.: *See—*
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Haberland, Ulrich: *See—*
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Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy Corporation. Polyglycidyl compounds containing n-heterocyclic structure. 4,001,236, Cl. 260-256.40F.

Habu, Teiji: *See—*
Nakajima, Tomio; Habu, Teiji; Sakamoto, Elichi; Yamada, Hiroshi; Mitsui, Katsuhide; and Hayashi, Eisaku, 4,001,021.

Hadler, Howard, to Chromalloy American Corporation. Safety stop for portable augers and like elevating machinery. 4,000,805, Cl. 198-320.000.

Haese, Egon, to Dr. C. Otto & Comp. G.m.b.H. Process for removing ammonia from gases. 4,001,374, Cl. 423-237.000.

Haffer, Gregor: *See—*
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 4,001,302.

Haffner, Mark P.; and Pizer, Robert S., to United States of America, Transportation. Programmable anthropomorphic articulation. 4,000,564, Cl. 35-17.000.

Hagen, Russell Louis: *See—*
Denny, William Michael; Hagen, Russell Louis; and Leung, Steve Ka-Lai, 4,001,699.

Hager Aktiebolag: *See—*
Hager, Bror Olof, 4,001,400.

Hager, Bror Olof, to Hager Aktiebolag. Preservative for wood. 4,001,400, Cl. 424-134.000.

Hagino, Hiroyasu: *See—*
Kajiwara, Yasuya; Nagai, Seiichi; and Hagino, Hiroyasu, 4,001,873.
Hahn, Heinrich; Heumann, Hans; and Schweppe, Manfred, to Veba-Chemie AG. Method for producing stabilized ammonium nitrate. 4,001,377, Cl. 423-267.000.
Hahn, Paul-Jurgen: *See—*
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Haldex Aktiebolag: *See—*
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Hall, Gordon R.: *See—*
Wong, Wilford F.; Hall, Gordon R.; Tsukahira, Tatsuo W.; and Sutton, Robert D., 4,000,869.
Hall, Kilmer L.; Davis, Allen E.; and Peck, Robert L., to United States of America, Army. Mode control computer interface. 4,001,554, Cl. 235-150.000.
Hall, Thomas N.; and Gilligan, William H., to United States of America, Navy. Removal of tetranitromethane from TNT plant waste. 4,001,373, Cl. 423-236.000.
Halliar, William R., to Pullman Incorporated. Trough hatch locking device. 4,000,703, Cl. 105-377.000.
Halpern, Alfred: *See—*
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Ham, Allan L.: *See—*
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Hamana, Isao; Fujiwara, Yoshio; and Kumakawa, Shiro, to Teijin Limited. Novel naphthalate polyester fibers, and their end uses. 4,001,479, Cl. 428-272.000.
Hamill, Robert L.: *See—*
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Hammann, Ingeborg: *See—*
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Hammond Corporation: *See—*
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Han, Hak Rhim, to Minnesota Mining and Manufacturing Company. Tape closures. 4,000,824, Cl. 215-232.000.
Hanifl, Paul, to International Paper Company. Urine metering and collection system. 4,000,649, Cl. 73-219.000.
Hannover, Hans-Otto; and Spoler, Johannes Gerhard, to Demag Aktiengesellschaft. Railway vehicle and switching mechanism therefor. 4,000,700, Cl. 104-130.000.
Hansen, Hanspeter: *See—*
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Harada, Hirokichi, to Fujisawa Pharmaceutical Co., Ltd. Pyridyl substituted 7-αesters of 3 heterothio 7-acetamido cephalosporanic acids. 4,001,225, Cl. 260-243.00C.
Harada, Koji: *See—*
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Harada, Seiki: *See—*
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Harashima, Kiyoshi: *See—*
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Harbert, Charles A.: *See—*
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Hardison, Jerry C.; and Gray, Laverne E., to Lone Star Container Sales Corporation. Shipping-display container. 4,000,811, Cl. 206-44.00R.
Hardman, Harley F.: *See—*
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Hardy, Michel: *See—*
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Harnisch, Horst; and Brack, Alfred, to Bayer Aktiengesellschaft. Naphtholactam dyestuffs. 4,001,253, Cl. 260-294.80B.
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Harrell, John W.: *See—*
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Harris, Dallas R., to Cummins Engine Company, Inc. Aftercooler coolant flow control for internal combustion engine. 4,000,725, Cl. 123-119.0CD.
Harris, Leonard F.: *See—*
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Harris, Lewis Karl; Burrus, Billy Steve; and Allison, Donald Wayne, to Combustion Engineering, Inc. Turbine meter rotor bearing. 4,000,932, Cl. 308-237.00R.
Harris, Rano J., Jr. Automatic fluid injector. 4,000,654, Cl. 73-422.0GC.
Harrison, Ian T.: *See—*
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Harrison, Jack M. Scheduling board and method of use thereof. 4,000,571, Cl. 40-19.500.
Harrison, John M.: *See—*
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Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, to Imperial Chemical Industries Limited. Dyeing process. 4,000,970, Cl. 8-178.00R.
Harvey, Harold F., to Roberts, Millard F., a part interest. Portable antenna mount for trucks. 4,001,831, Cl. 343-715.000.
Harvey, Jay A., to Great Lakes Carbon Corporation. Method of sealing porous material defining a recess. 4,001,469, Cl. 427-238.000.
Hase, Alfred Max. Pulse-firing power oscillator. 4,001,717, Cl. 331-55.000.
Hasegawa, Akira: *See—*
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Hatsumi, Ryoichi: *See—*
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Haugsjaa, Paul Osborne; and Regan, Robert James, to GTE Laboratories Incorporated. High frequency excited electrodeless light source. 4,001,632, Cl. 315-39.000.
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Hayashi, Jun; Sato, Akira; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Developing a silver halide emulsion in contact with a heterocyclic thione and a polyalkylene oxide. 4,001,020, Cl. 96-66.300.
Hayashi, Katsuyoshi: *See—*
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Hayashi, Takao; and Matsuo, Masashi, to Asahi Glass Co., Ltd. Method of preparing polyfluoroalkyl group containing compounds. 4,001,309, Cl. 260-493.000.
Hayashi, Yoshiki: *See—*
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Hazleton, Herbert T., to Federal Pioneer Electric Limited. Calibrating adjustment of thermostat. 4,001,752, Cl. 337-368.000.
Hazleton, Herbert T., to Federal Pioneer Electric Limited. Thermostat having stable mounting support. 4,001,753, Cl. 337-380.000.
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Hebert, Roger T.: *See—*
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Heien, Sigurd. Combined mooring and transfer means for oil and other liquid. 4,000,713, Cl. 114-294.000.

Heijne, Leopold, to U.S. Philips Corporation. Measuring cell for determining oxygen concentrations in a gas mixture. 4,001,756, Cl. 338-34.000.

Heilemann, Volkmar. Solar-heated dwelling. 4,000,851, Cl. 237-1.00A.

Heinrich Kopp, Inhaber Theodor Simoneit, Firma: *See*—
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Heinzer, Paul; and Wulz, Helmut, to Wifo Wissenschaftliches Forschungs-Institut A.G. Apparatus for fixing electrophotographic images. 4,001,544, Cl. 219-216.000.

Held, Leon D. Direct individual program readout of eight-track tape cartridge. 4,001,891, Cl. 360-132.000.

Heller, William C., Jr.; and Leatherman, Alfred F., to Heller, William C., Jr. Plastic hose having embedded reinforcing braid. 4,000,760, Cl. 138-141.000.

Hellqvist, Ake O. W. Method for natural biochemical decomposition of latrine. 4,001,108, Cl. 210-12.000.

Helmer, Howard Lyle: *See*—
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Hemingway, Maurice; and Ward, Trevor, to Hotwork International Limited. Method of heating up glass melting furnaces or the like. 4,000,962, Cl. 432-4.000.

Hemmi, Christian O.: *See*—
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Hemotec, Inc.: *See*—
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Hendrickson, Thomas Allen, to International Business Machines Corporation. Automatic terminal data rate selection. 4,001,504, Cl. 178-68.000.

Henkel & Cie G.m.b.H.: *See*—
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Henninghaus, Franz, to International Harvester Company. Hydraulic power system with automatic priority-demand flow control means. 4,000,751, Cl. 137-101.000.

Henrickson, Gary C.: *See*—
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Henrie, James O., to Rockwell International Corporation. Thermal recombiner. 4,000,978, Cl. 23-277.00R.

Henry, Rodney D.; and Besser, Paul J., to Rockwell International Corporation. Magnetic bubble domain composite with hard bubble suppression. 4,001,793, Cl. 340-174.0TF.

Herbst, Wayne R.; and Mika, Paul L., to Teletype Corporation. Apparatus and method for recording and reproducing digital-data. 4,001,884, Cl. 360-40.000.

Hereth, Ralph F., to Wilkins & Associates, Inc. Honeycomb panel cellular structure having triangular cells. 4,001,474, Cl. 428-116.000.

Herman Schwabe, Inc.: *See*—
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Herron, Edwin W.: *See*—
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Hershman, Arnold; and Pearson, Anthony J. C., to Monsanto Company. Repression of polymer formation in the conversion of linear or branched primary diamines to cyclic imines. 4,001,213, Cl. 260-239.00B.

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Warp, Rick A.; Morton, John L., Jr.; and Azmoon, Majid, 4,000,803.

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Heyman Manufacturing Company: *See*—
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Higa, Teikichi: *See*—
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Higgins, Mark Allan: *See*—
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Higgs, William York, to Intercontinental Marine Limited. Anchoring device for buoyant life saving equipment. 4,000,533, Cl. 9-9.000.

Hile, John W.; and Rabe, Paul R., to General Motors Corporation. Solid-state threshold detector. 4,001,676, Cl. 324-60.0CD.

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Hillman, Alfred K., Jr.: *See*—
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Hiramatsu, Takashi: *See*—
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Hirao, Mamoru; and Sato, Yoshinori, to Hayashibara Company. Process for preparing foods and drinks. 4,001,435, Cl. 426-3.000.

Hirata, Noritsugu: *See*—
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Hirata, Yoshimi: *See*—
Aoki, Teruaki; Yamoto, Hisayoshi; Okayama, Masanori; Hirata, Yoshimi; Sato, Shuichi; and Yamada, Takaaki, 4,001,762.

Hirohashi, Toshiyuki; Sato, Hiromi; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. 1-Substituted-1,2-dihydrothieno[2,3-d]-pyrimidin-2-one derivatives. 4,001,412, Cl. 424-251.000.

Hirooka, Masaaki; Fujii, Yoshikazu; and Hata, Kazuhiko, to Sumitomo Chemical Company, Limited. Method for treating leather. 4,000,958, Cl. 427-389.000.

Hirooka, Masaaki: *See*—
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Hirshman, Justin L.: *See*—
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Hirsimaki, Paul A. Calculator. 4,001,551, Cl. 235-70.00A.

Hitachi Electronics Co., Ltd.: *See*—
Kurata, Kazuhiro; Honma, Kozi; Ogirima, Masahiko; Ono, Yuichi; and Keikoin, Yoshiteru, 4,000,716.

Hitachi, Ltd.: *See*—
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Nomoto, Yoshihisa; Takegami, Shigeru; Nakakubo, Koichi; and Yoneyama, Takao, 4,001,503.
Saiki, Atsushi; Sato, Kikuji; Harada, Seiki; Tsunoda, Terue; and Oba, Yoichi, 4,001,870.
Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; and Honma, Isao, 4,000,927.
Tajima, Kunio; Kawakami, Touhei; and Hayashi, Seiichi, 4,000,945.
Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, 4,001,481.

Hitachi Shipbuilding and Engineering Co., Ltd.: *See*—
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Harada, Koji; and Murata, Seiichiro, 4,000,711.

Hixson, Claude M., to Don R. Hinderliter, Inc. Method and apparatus for forming a sheave from a flat disc of metal. 4,000,634, Cl. 72-69.000.

Hjalmarsson, Jan: *See*—
Wingbro, Torgny; Hjalmarsson, Jan; and Pettersson, Per August, 4,000,815.

Hobart Corporation: *See*—
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Hochreuter, Richard, to Sandoz Ltd. Amidopolyaminesulfonates. 4,001,285, Cl. 260-401.000.

Hoechst Aktiengesellschaft: *See*—
Gunther, Dieter; Nestler, Hans Jurgen; Rosch, Gunter; and Schinzel, Erich, 4,001,221.
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Hoer, Cletus A.; and Engen, Glenn F., to United States of America, Air Force. Vector voltmeter. 4,001,681, Cl. 324-83.00R.

Hoerner Waldorf Corporation: *See—*
Sorensen, Wayne H.; and Sorenson, John F., 4,000,843.

Hofer, Helmut H., to Texas Instruments Incorporated. Roll-a-long three-dimensional common depth point exploration. 4,001,770, Cl. 340-15.5MC.

Hofer, Wolfgang, to Bayer Aktiengesellschaft. Preparation of O,S-dimethyl-thiol-phosphoric acid diester-amide. 4,001,353, Cl. 260-984.000.

Hoffman, Werner, to BASF Aktiengesellschaft. 2,6,10-Trimethyl-dodecan-1-al and 2,6,10-trimethyl-dodeca-4,8-dien-1-al. 4,001,336, Cl. 260-601.00R.

Hoffmann, Hellmut; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. N-Dithiophosphoryl-carbamic acid esters. 4,001,404, Cl. 424-212.000.

Hoffmann, Herwig; Boettger, Guenther; Baer, Karl; Wache, Harro; Graefje, Heinz; and Koernig, Wolfgang, to BASF Aktiengesellschaft. Catalyst for partial hydrogenation. 4,001,344, Cl. 260-635.00M.

Hoffmann-La Roche Inc.: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,001,339.
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Hofste op Bruinink, Antonius Isidorus, to U.S. Philips Corporation. Apparatus with headwheel servo for recording and playing back video information. 4,001,886, Cl. 360-75.000.

Holden, Gordon Alan, to Crimpfil Limited. Production of bulky yarns. 4,000,551, Cl. 28-72.120.

Holl, Richard Adolf, to Micron Engineering Inc. Process for scrubbing gas streams. 4,000,993, Cl. 55-94.000.

Holland, Warren E.; and Burrell, George R., to Exxon Production Research Company. Acoustic method for detecting leaks from submerged pipelines. 4,001,764, Cl. 340-3.00R.

Hollands, Daniel H.: *See—*
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Honegger, Werner: *See—*
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Goodman, Roger John, 4,001,745.
Pearson, Robert P., 4,000,643.
Saul, Glenn; and Bur, Philip W., 4,001,703.

Honeywell Information Systems, Inc.: *See—*
Barlow, George J., 4,001,790.
Kayser, Wolfgang W. O. G., 4,001,890.
Monahan, Earnest M.; Patterson, Garvin W.; and Calle, Jaime, 4,001,783.
Patterson, Garvin Wesley; and Porter, Marion G., 4,001,788.
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Honeywell Information Systems Italia: *See—*
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Honma, Isao: *See—*
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Honma, Kozi: *See—*
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Honna, Kosaku: *See—*
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Hood, Larry Lee, to Quaker Oats Company, The. Color stabilized product and process. 4,001,446, Cl. 426-250.000.

Hoover Ball and Bearing Company: *See—*
Doerr, Wendell P.; and Janko, George F., 4,000,925.

Hopkins, David Alan, to Valeron Corporation, The. Bending bar constructed by bending. 4,000,667, Cl. 76-101.00R.

Horizon Industries, Inc.: *See—*
Spirer, Peter R., 4,000,707.

Horn, Clifford V. Surgical incision shield. 4,000,737, Cl. 128-154.000.

Horn, Hans Christoph: *See—*
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Hornung, Louis Michael: *See—*
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Horowitz, Samuel Jacob, to Du Pont de Nemours, E. I., and Company. Novel silver compositions. 4,001,146, Cl. 252-514.000.

Horrocks, Derek; Buckley, Keith; and Vernon, Alan John, to Pedigree Petfoods Limited. Preserved meat. 4,001,445, Cl. 426-250.000.

Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, to Taurus Gumiipari Vallalat. Coupling for reinforced flexible hoses. 4,000,920, Cl. 285-149.000.

Horwath, Robert Otto; and Rotheim, Philip, to Standard Brands Incorporated. Process for producing isoamylase. 4,001,083, Cl. 195-65.000.

Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, to Standard Brands Incorporated. Process for producing isoamylase. 4,001,084, Cl. 195-65.000.

Hosoe, Kazuya: *See—*
Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu; and Takahashi, Kiyoshi, 4,000,940.

Hospital Marketing Services Co., Inc.: *See—*
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Hotwork International Limited: *See—*
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House, Bruce F., to Shelley Manufacturing Company. Sliced bread dispenser. 4,000,831, Cl. 221-196.000.

Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: *See—*
Preuss, Arnfried, 4,001,669.

Howard, Colin Robert: *See—*
Maltman, William Ramsey; and Howard, Colin Robert, 4,001,476.

Howell, Edward Keith, to General Electric Company. Ground fault circuit interrupter utilizing a single transformer. 4,001,646, Cl. 317-18.00D.

Howell, Michael L., to Rank Xerox Ltd. Directional sources of electromagnetic radiation. 4,001,622, Cl. 313-113.000.

Howell, William L. Parenteral fluid administration set (plastic-bag type). 4,000,738, Cl. 128-214.00D.

Howie, David Malcolm; McKenzie, Roy Victor W.; and Snape, James Ronald, to Pyrotenax of Canada Limited. Heating cables and manufacture thereof. 4,001,760, Cl. 338-238.000.

Howles, Donald Arthur; and Page, Robert Brian, to Thorn Electrical Industries Limited. Arc tube for high-pressure mercury/metal halide lamp. 4,001,623, Cl. 313-184.000.

Hoya Glass Works, Ltd.: *See—*
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Hoyt, Earl, to Welch Foods Inc. Freezable confection package. 4,001,440, Cl. 426-104.000.

Hrbacek, Benny A.; and Grovenstein, Lewis F., Jr., to Systron Donner Corporation. Automatic deviation analysis meter. 4,001,695, Cl. 325-363.000.

Huber, Gunter: *See—*
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Huber, Ulrich; Kosslakoff, Nicolas; and Vaterlaus, Bruno, to Givaudan Corporation. Sweetening compositions. 4,001,453, Cl. 426-533.000.

Hucal, Taras: *See—*
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Hudson, Ronald Augustus: *See—*
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Hughes Aircraft Company: *See—*
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Hughes Microelectronics Limited: *See—*
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Huignard, Jean-Pierre: *See—*
d'Auria, Luigi; Huignard, Jean-Pierre; Reboul, Jean Philippe; and Le Carvennec, Francois, 4,001,635.

Hulshizer, Stephen Joseph. Electrical timer-switch. 4,001,527, Cl. 200-38.0FB.

Humes Limited: *See—*
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Hummeldorf, James L.: *See—*
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Hunter, A. Bruce. Thickening apparatus. 4,001,119, Cl. 210-402.000.

Hurwitz, Michael J., to Westinghouse Electric Corporation. Acoustic lens system. 4,001,766, Cl. 340-8.00L.

Husbands, George E. M., to American Home Products Corporation. 15-Ethynyl-PGE_2. 4,001,314, Cl. 260-514.00D.

Hussey, Eugene H., to Polymer Corporation, The. Long-wearing plastic bearings. 4,001,124, Cl. 252-12.000.

Huttebraucker, Dag-Harald: *See—*
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Hyltin, Tom M., to Seiko Instruments Incorporated. D.C. potential multiplier. 4,001,664, Cl. 321-15.000.

I-T Safety Enterprises Limited: *See—*
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Ichiyanagi, Toshikazu: *See—*
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Igisu, Taro, to EIM Electric Co., Ltd. Method of removing residual stress of a work formed of metal or ceramic and a sealing apparatus. 4,001,053, Cl. 148-12.900.
Ignatoski, Joseph A.: *See—*
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Iguchi, Masaaki: *See—*
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Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, to Kyodo Insatsu Kabushiki Kaisha. Variable scale relief reproduction process and product thereof. 4,001,062, Cl. 156-59.000.
Iizuka, Haruhiko: *See—*
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Iizuka, Nobuhiro; and Shigemori, Hideto, to Glory Kogyo Kabushiki Kaisha. Monetary receipt and payment managing apparatus. 4,001,568, Cl. 235-156.000.
Ikechi, Masai; and Kusano, Kuniyuki, to Fuji Photo Film Co., Ltd. Developing device. 4,001,857, Cl. 354-337.000.
Ikushima, Yoshiyuki, to Sharp Kabushiki Kaisha. Video recording and reproducing system. 4,001,885, Cl. 360-70.000.
Illinois Nuclear Electronics, Inc.: *See—*
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Imai, Shozaburo; and Hirooka, Masaaki, to Sumitomo Chemical Company, Limited. Aqueous dispersion of olefin-acrylate copolymer. 4,001,159, Cl. 260-29.6TA.
Imamura, Yoshio: *See—*
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Galt, Ronald Hilson Begg; and Pearce, Robert James, 4,001,419.
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Inbar, Dan, to Elscint Ltd. Scintillation camera and head therefor having means for improving resolution over a limited field of view. 4,001,591, Cl. 250-363.00S.
Ing. C. Olivetti & C., S.p.A.: *See—*
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Ingrip Fasteners Inc.: *See—*
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Irwin, John W., to General Electric Company. Blowoff baffle. 4,000,779, Cl. 165-111.000.
Isharani, Jayanti V.: *See—*
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Ishimi, Kazuo, to Nippon Kayaku Kabushiki Kaisha. Method for manufacture of methacrylic acid. 4,001,316, Cl. 260-530.00N.
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Itabashi, Yoshio; Noguchi, Kentaro; and Seki, Masao, to Kanebo, Ltd. Method of producing polyesters terephthalic acid and ethylene glycol. 4,001,187, Cl. 260-75.00M.
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Ito, Masahiko; Wada, Hiromichi; Kondo, Fumio; and Kai, Fukio, to Dainichiseika Color & Chemicals Mfg. Co., Ltd. Coloring composition. 4,001,035, Cl. 106-307.000.
Ito, Tadahiko; Shiomi, Yoshinori; and Iwasa, Seizo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Means for actuating balancer of engine. 4,000,666, Cl. 74-604.000.
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Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, to Canon Kabushiki Kaisha. Transfer medium separating device. 4,000,942, Cl. 355-3.00R.
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Iwakura, Junji; Sato, Kimihiko; Fujii, Hisashi; Hashimoto, Yoshihiro; Ono, Shigeo; Watanabe, Shozaburo; and Yokoyama, Akio, to Asahi Glass Co., Ltd. Process for recovery of oxides of sulfur from combustion waste gas. 4,001,384, Cl. 423-551.000.
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Jaeggi, Kurt; Krasnobajew, Victor; Weber, Peter; and Wild, Jost, to Givaudan Corporation. Process for making and flavorants from milk products and compositions containing same. 4,001,437, Cl. 426-34.000.
Jallageas, Jean-Claude: *See—*
Commeyras, Auguste; Arnaud, Alain; Galzy, Pierre; and Jallageas, Jean-Claude, 4,001,081.
James, Leo F.: *See—*
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James, Ronald: *See—*
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Janko, George F.: *See—*
Doerr, Wendell P.; and Janko, George F., 4,000,925.
Jansson, Olof T., to Clama Industri Aktiebolag. Method for the production of clips. 4,000,763, Cl. 140-82.000.
Japan Exlan Company Limited: *See—*
Matsumura, Yasuo; Kishimoto, Soichiro; and Okazaki, Saburo, 4,001,382.
Japan Gasoline Co., Ltd.: *See—*
Okagami, Akio; Uemoto, Kunihiko; and Satoh, Kouichi, 4,000,987.
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Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, to Laboratorios Made, S.A. 1,3,4-Trimethyl-2-(3,4,5-trimethoxybenzyl)-1,2,5,6-tetrahydropyridine and analgesic composition and method using it. 4,001,414, Cl. 424-263.000.
Jasnosz, John J., to Petrochemicals Company, Inc. Anti-caking of nitrogenous materials. 4,001,378, Cl. 423-268.000.
Jeanmart, Claude: *See—*
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Jefferson, Mark T.: *See—*
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Jemison, William; Orlando, Salvatore; and Fink, Richard, to Heyman Manufacturing Company. One-piece strain relief bushing with independent holding means. 4,000,875, Cl. 248-56.000.
Jenaer Glaswerk Schott & Gen.: *See—*
Lindig, Otto; and Sack, Werner, 4,001,741.
Jencks, Charles L.; and Castonguay, Roger N., to General Electric Company. Circuit breaker having improved operating mechanism. 4,001,742, Cl. 335-173.000.
Jeser, Jean Pierre: *See—*
Danielmeyer, Hans-Gunter; Jeser, Jean Pierre; Kruhler, Walter-Wolfgang; Thiemann, Karl-Heinz; and Huber, Gunter, 4,001,704.
Jindra, Henri; and Clinton, William Patrick, to General Foods Corporation. Flavoring foods with 8-methyl-non-2ynol and its derivatives. 4,001,454, Cl. 426-534.000.
Johannessen, Paul R., to Megapulse Incorporated. Sequential power supply and method for RF pulse generation. 4,001,598, Cl. 307-106.000.
John, Carl, to Demag Aktiengesellschaft. Method and apparatus for protecting support elements for cast metal strands during strand cutting. 4,001,051, Cl. 148-9.00R.
John Wyeth & Brother Limited: *See—*
Curran, Adrian Charles Ward, 4,001,330.
Johns Hopkins University, The: *See—*
Rabenhorst, David W., 4,000,665.
Johns-Manville Corporation: *See—*
Sullivan, Daryl Dean; and Odle, Herbert Arnold, 4,001,575.
Johnson, Arthur L., Jr.; and Dodge, Marlow W., to Johnson Enterprises, Inc. Container closure unit. 4,000,829, Cl. 220-265.000.
Johnson, Burnett H.; and Huff, Terrence, to Exxon Research and Engineering Company. Wettable non-woven structures and components thereof. 4,000,967, Cl. 8-115.500.
Johnson, David Emil, to Mobil Oil Corporation. Butt welder cutting element temperature control. 4,001,067, Cl. 156-159.000.
Johnson Enterprises, Inc.: *See—*
Johnson, Arthur L., Jr.; and Dodge, Marlow W., 4,000,829.
Johnson, Frank N., to J. T. Cullen Company. Furnace exhaust duct. 4,000,886, Cl. 266-147.000.
Johnson, James W.: *See—*
Bryan, Harold; and Johnson, James W., 4,000,952.
Johnson, Olof C., Jr.; Whitney, Robert E.; and Froehling, Dieter K., to Eikonix Corporation. Film thermal processing. 4,001,546, Cl. 219-216.000.
Johnson, Richard C., to Communications International Corporation. Message communication system for telephone lines. 4,001,508, Cl. 179-6.00D.
Johnson, Richard C.: *See—*
Hatch, Gilbert J.; Johnson, Richard C.; and Kulbida, Ihor, 4,001,541.
Johnston, Howard, to Dow Chemical Company, The. Substituted pyrimidinyloxy(thio)phenyl ureas and derivatives thereof. 4,001,234, Cl. 260-256.40C.
Jolles, Pierre; and Migliore-Samour, Daniele, to Agence Nationale de Valorisation de la Recherche (ANVAR). Hydrosoluble extracts of mycobacteria. 4,001,395, Cl. 424-92.000.
Jonas, Hans: *See—*
Schumacher, Otto; and Jonas, Hans, 4,001,487.
Jones, Calvin Coolidge, Jr.: *See—*
Barrett, Gerald George; Hornung, Louis Michael; and Jones, Calvin Coolidge, Jr., 4,001,673.
Jones, Charles D., to Eli Lilly and Company. Derivatives of 24-methylene-14a-aza-D-homo-cholestadienes. 4,001,246, Cl. 260-288.0CF.
Jones, Claude Elmer. Clamping apparatus. 4,000,576, Cl. 43-5.000.
Jones, Herman L.; and Haugen, John H. Apparatus for producing individual photographic prints with strip adhesive backing. 4,001,073, Cl. 156-516.000.
Jones, Thomas: *See—*
Patel, Suman H.; and Jones, Thomas, 4,001,722.
Jones, Trevor Clifford, to Underground Location Services Limited. Measuring devices for bores and ducts. 4,000,655, Cl. 73-432.00R.
Jordan, George, to Hospital Marketing Services Co., Inc. Refrigerating package. 4,000,996, Cl. 62-4.000.
Joseph, Joel J.; and Keigher, John R., to SCM Corporation. Waste water treatment process. 4,001,114, Cl. 210-44.000.
Juilfs, Donald R.: *See—*
Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., 4,001,769.
Jumer, John F. Method for incremental electro-processing of large areas. 4,001,094, Cl. 204-129.600.
Juna, Kiyoshi; Ohdan, Koji; Nakayama, Hiroyuki; and Asada, Kiyohiko, to Kansai Paint Company, Ltd. Composition for preparing electroconductive resin comprising an unsaturated polyester and phosphoric or sulfonic unsaturated ester. 4,001,150, Cl. 260-17.00R.
Jurisch, Louis A.: *See—*
Robinson, Glenn Nelson; and Jurisch, Louis A., 4,001,068.
Justice, Timothy R.; and Foreman, Robert W., to Park Chemical Co. Method of stripping paint in a molten salt bath. 4,001,038, Cl. 134-38.000.
Juzvyak, Albert Genrikhovich: *See—*
Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.
Kaasenbrood, Petrus J. C., to Stamicarbon B.V. Method for controlling the ammonia and CO_2 ratios in a urea manufacturing process. 4,001,320, Cl. 260-555.00A.
Kabushiki Kaisha Bambi: *See—*
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Kabushiki Kaisha Hattori: *See—*
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Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
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Kai, Fukio: *See—*
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Kaiser Aluminum & Chemical Corporation: *See—*
Cassens, Nicholas, Jr., 4,001,029.
Pearson, Michael J.; Rigge, Ronald J.; and Carniglia, Stephen C., 4,001,144.
Kaiser, Werner; and Abendroth, Paul, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Safe access arrangement for driven mechanisms in a printing press. 4,000,693, Cl. 101-183.000.
Kajikawa, Yoji: *See—*
Miyoshi, Jun; Kajikawa, Yoji; Ota, Akira; Asaoka, Junichi; and Kino, Yoshio, 4,001,044.
Kajiwara, Yasuya; Nagai, Seiichi; and Hagino, Hiroyasu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,001,873, Cl. 357-59.000.
Kalina, Vladimir, to Societe d'Assistance Technique pour Produits Nestle S.A. Process and apparatus for the culture of microorganisms. 4,001,090, Cl. 195-109.000.
Kalinin, Lev Pavlovich: *See—*
Postolaty, Vitaly Mikhailovich; Venikov, Valentin Andreevich; Astakhov, Jury Nikolaevich; Chaly, Georgy Vladimirovich; and Kalinin, Lev Pavlovich, 4,001,672.
Kallay, Maria: *See—*
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Kalo Laboratories, Inc.: *See—*
Nash, Lawrence H., 4,001,006.
Kalopissis, Gregoire; and Vanlerberghe, Guy, to Societe Anonyme dit: L'Oreal. Cosmetic emulsifiers. 4,001,141, Cl. 252-351.000.
Kaminow, Ivan Paul, to Bell Telephone Laboratories, Incorporated. Planar waveguide electrooptic prism deflector. 4,000,937, Cl. 350-96.0WG.
Kanbara, Kenjiro; Hattori, Masayuki; Miyasita, Satoru; Iguchi, Masaaki; and Yoda, Jihei, to Nippon Steel Corporation. Method for processing reduced iron. 4,001,010, Cl. 75-35.000.
Kanebo, Ltd.: *See—*
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Kaneko, Takashi: *See*—
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Kansai Paint Company, Ltd.: *See*—
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Kaplan, Murray Arthur: *See*—
Granatek, Alphonse Peter; and Kaplan, Murray Arthur, 4,001,409.
Karger, Eva R.; and MacGregor, Paul T., to Polaroid Corporation. 3,3-Disubstituted phthalides and naphthalides. 4,001,277, Cl. 260-326.13R.
Karino, Takafumi: *See*—
Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; and Honma, Isao, 4,000,927.
Karklys, Joseph, to Whirlpool Corporation. Appliance programmer with integrated circuit. 4,001,599, Cl. 307-141.000.
Karpluk, Richard William, to Albany International Corporation. Apparatus for cutting knots and slubs out of continuous yarn lengths. 4,000,550, Cl. 28-64.000.
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich. Ribbon type loudspeaker. 4,001,522, Cl. 179-115.00V.
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich. Ribbon loudspeaker. 4,001,523, Cl. 179-115.00V.
Kaseman, Paul Warren, to RCA Corporation. Electron discharge image tube with electrostatic field shaping electrode. 4,001,618, Cl. 313-94.000.
Kashiwada, Yasutoshi: *See*—
Megumi, Kouiti; Nagatsuma, Kazuyuki; Kashiwada, Yasutoshi; and Furuhata, Yoshio, 4,001,127.
Kaspari, William J.: *See*—
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Kato, Hiroyuki: *See*—
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Kato, Kimpei: *See*—
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Katsumoto, Kiyoshi, to Chevron Research Company. Recovery of 2-pyrrolidone from aqueous solutions. 4,001,274, Cl. 260-326.5FN.
Katsurada, Yasuo: *See*—
Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, 4,001,062.
Katz, Bruce J. Belt-supported camera carrying case. 4,000,769, Cl. 150-52.00J.
Katz, Seymour; and Brown, Victor R., to IPCO Hospital Supply Corporation. Film identification apparatus. 4,001,592, Cl. 250-476.000.
Kaufhold, Frederick D.: *See*—
Olashaw, William F.; and Kaufhold, Frederick D., 4,001,653.
Kaufman, Barry M., to R F L Industries, Inc. High speed FM and AM demodulator. 4,001,702, Cl. 329-135.000.
Kauneckas, John J. Recording system for photographic cameras. 4,001,846, Cl. 354-105.000.
Kawabata, Hidetoshi: *See*—
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.
Kawabe, Ushio: *See*—
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Kawai, Hisasi, to Nippon Soken, Inc. Digital interpolator. 4,001,565, Cl. 235-152.000.
Kawakami, Touhei: *See*—
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Kawasaki, Mitsuru: *See*—
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Kayser, Wolfgang W. O. G., to Honeywell Information Systems, Inc. Double chip flying head. 4,001,890, Cl. 360-121.000.
Keasler, Ben C. Blind bolt fastener installation tool with an apparatus for retrieving severed blind bolt fastener stems. 4,000,668, Cl. 81-55.000.
Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Anhydrous products having improved wettability characteristics. 4,001,151, Cl. 260-17.4ST.
Keener, Robert M.: *See*—
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Keigher, John R.: *See*—
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Keikoin, Yoshiteru: *See*—
Kurata, Kazuhiro; Honma, Kozi; Ogirima, Masahiko; Ono, Yuichi; and Keikoin, Yoshiteru, 4,000,716.
Keller, Anthony F., to Motorola, Inc. Variable high frequency crystal oscillator. 4,001,724, Cl. 331-116.00R.
Kelley, O. W., to Oxbow Products, Inc. Fish bait box. 4,000,577, Cl. 43-55.000.
Kelling, Leroy U. C., to General Electric Company. Average phase position circuit. 4,001,558, Cl. 235-151.110.
Kelly, John, personal representative: *See*—
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Kelly, Monica, personal representative: *See*—
Kelly, William, deceased; Kelly, Monica, personal representative; Kelly, John, personal representative; and Halpern, Alfred, 4,001,311.
Kelly, Thomas M. Wall supporting structure. 4,000,592, Cl. 52-149.000.
Kelly, William, deceased; by Kelly, Monica, personal representative; by Kelly, John, personal representative; and Halpern, Alfred, to Synergistics, Inc. Stabilized choline salicylate compounds. 4,001,311, Cl. 260-501.150.
Kelsey-Hayes Company: *See*—
Drake, Charles J.; and Farrow, John F., 4,001,540.
Kemper, Orville. Evaporation accelerator. 4,001,077, Cl. 159-4.00S.
Kempter, Firtz Erdmann; Sabelus, Guenther; and Spoor, Herbert, to BASF Aktiengesellschaft. Paint binders of Mannich bases and epoxy resins. 4,001,155, Cl. 260-29.2EP.
Kendall Company, The: *See*—
Binard, William J.; Cirirco, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,000,741.
Zoephel, Richard L.; and Bolker, James H., 4,000,521.
Kennecott Copper Corporation: *See*—
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Kennett, Barrington George; and Miller, Adrian Ernest, to International Standard Electric Corporation. Power control circuit for a power oscillator. 4,001,727, Cl. 331-182.000.
Kerr, Glenn W.: *See*—
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Kershaw, Stanley Scott, Jr., to McGraw-Edison Company. Station lightning arrester with dual rupture diaphragms for gas pressure release. 4,001,651, Cl. 317-61.000.
Kettler, Erich, to Georg Fischer Aktiengesellschaft. Apparatus for producing casting molds. 4,000,772, Cl. 164-194.000.
Keyes, Melvin H., to Owens-Illinois, Inc. Immobilization of enzymes on an inorganic matrix. 4,001,085, Cl. 195-68.000.
Khajezadeh, Heshmat, to RCA Corporation. High-reliability plastic-packaged semiconductor device. 4,001,872, Cl. 357-54.000.
Khanna, Ram-Tirth, to Du Pont de Nemours, E. I., and Company. Polymeric fibers containing color concentrates. 4,001,171, Cl. 260-40.00R.
Khlyntsev, Alexandr Sergeevich: *See*—
Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich; Khlyntsev, Alexandr Sergeevich; Barsova, Antonina Petrovna; and Rodionova, Galina Alexeevna, 4,000,636.
Kiehl, Paul G., to Visual Data Corporation. Mailing viewer for slides and the like. 4,000,572, Cl. 40-63.00A.
Kiemle, Horst, to Siemens Aktiengesellschaft. Holographic storage device. 4,001,791, Cl. 340-173.0LM.
Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. 2-Oxocyclopenta[b]furan-5α-carboxylic acid esters. 4,001,281, Cl. 260-343.30R.
Kikukawa, Tsuyoshi; and Hashimoto, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Data reading apparatus. 4,001,780, Cl. 340-146.30D.
Kilbride, Robert S.: *See*—
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Kim, Jonathan J.: *See*—
Agarwal, Jagdish C.; Ammann, Paul R.; and Kim, Jonathan J., 4,001,011.
Kim, Myung Ki; and Lugay, Joaquin Castro, to General Foods Corporation. Fibrous protein materials. 4,001,459, Cl. 426-656.000.
Kimberly-Clark Corporation: *See*—
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Kimmel, Milton Jay, to International Business Machines Corporation. Data processor for pattern recognition and the like. 4,001,787, Cl. 340-172.500.
Kimura, Toshimitsu: *See*—
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King, Robert W., to Avco Corporation. Three-dimensional fabric material. 4,001,478, Cl. 428-257.000.
Kinney, Thomas D.; and Pickett, John E. P. Light microscopy processing method. 4,001,460, Cl. 427-2.000.
Kino, Yoshio: *See*—
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Kirchhein, Albert: *See*—
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Kirk, James D., Jr. Building construction member. 4,000,594, Cl. 52-241.000.
Kirk, Norbert A. Rotary safety reflector. 4,000,938, Cl. 350-99.000.
Kirkley, David William: *See*—
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Kits van Heyningen, Arent H., to Raytheon Company. Electronically stabilized beam former system. 4,001,763, Cl. 340-3.0PS.
Kizawa, Hidenori: *See*—
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Klafka, Frank L., to Clevepak Corporation. Back-up brake assembly for a partition strip feeding mechanism in a partition fabricating machine. 4,000,891, Cl. 271-8.00R.
Klawitter, Jerome J.; and Bhatti, Nazir A., to United States of America, Navy. Ceramic prosthetic implant suitable for a knee joint plateau. 4,000,525, Cl. 3-1.911.
Klaxon: *See*—
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Klein, Johannes P.; Setlur, Swethadrivas R.; and Groenendaal, Willem, to Shell Oil Company. Process for H_2S removal employing a regenerable polyalkanolamine adsorbent. 4,001,386, Cl. 423-574.00L.
Klein, Keith W.; and Palmieri, Joseph M., to General Electric Company. Ground fault receptacle with unitary support of GFCI module and switching mechanism. 4,001,647, Cl. 317-18.00D.
Klein, Keith W.; and Palmieri, Joseph M., to General Electric Company. Ground fault receptacle with improved stationary contact mounting and backing. 4,001,652, Cl. 317-112.000.
Kleiner, Hans-Jerg; and Rupp, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of ethane-1,2-diphosphinic acid diesters. 4,001,352, Cl. 260-970.000.
Kleiner, Walter, to Staeubli Ltd. Device for controlling the sequence of movement of individual heddle frames of a weaving machine. 4,000,761, Cl. 139-66.00R.
Kleinschmidt, Peter, to Siemens Aktiengesellschaft. Device for the electrical determination of two-dimensional co-ordinates of a point. 4,001,677, Cl. 324-65.00R.
Klimchak, Edward G.: *See*—
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Kline, Robert W.: *See*—
Gorton, Earl M.; and Kline, Robert W., 4,001,345.
Klutchko, Sylvester; and von Strandtmann, Max, to Warner-Lambert Company. 4-Substituted-2, 3-dihydro-1-benzoxepin-3, 5-diones and tautomers. 4,001,224, Cl. 260-240.00R.
Knapp, Randolph H., to Shell Oil Company. Well treating process for consolidating particles with aqueous emulsions of epoxy resin components. 4,000,781, Cl. 166-276.000.
Knauf, Robert L.: *See*—
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Knavish, Leonard A.; and Cerutti, Richard L., to PPG Industries, Inc. Horizontal glassmaking furnace. 4,001,001, Cl. 65-337.000.
Knickerbocker, Karl. Coin totalizer mechanism. 4,000,799, Cl. 194-1.00L.
Knoll A.G. Chemische Fabriken: *See*—
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Knutson, William J.; and Smith, Daniel M., to Motorola, Inc. Radio frequency power amplifier constructed as hybrid microelectronic unit. 4,001,711, Cl. 330-66.000.
Kobayashi, Hiroo: *See*—
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Kobayashi, Yoshinori; Shibata, Yoshitaka; Hasegawa, Akira; and Iwatsuki, Yoshiharu, to Minolta Camera Kabushiki Kaisha. Resin-sealed type semiconductor device. 4,001,863, Cl. 357-30.000.
Kocmich, Donald Orrie, to Opti Products Incorporated. Tonometer tester. 4,000,640, Cl. 73-1.00B.
Kocsis, Joseph: *See*—
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Koernig, Wolfgang: *See*—
Hoffmann, Herwig; Boettger, Guenther; Baer, Karl; Wache, Harro; Graefje, Heinz; and Koernig, Wolfgang, 4,001,344.
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Kolbow, Peter: *See*—
Weiss, Herbert; Maurer, Otto; and Kolbow, Peter, 4,001,046.
Kolosko, Leon F.; and Topolski, Alvin S., to Wurlitzer Company, The. Two-speed automatic phonograph. 4,000,906, Cl. 274-9.00A.
Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu; and Takahashi, Kiyoshi, to Canon Kabushiki Kaisha. Camera allowing simultaneous sound recording. 4,000,940, Cl. 352-72.000.
Konarski, Mieczyslaw; and Nash, Dudley O., to General Electric Company. Thrust vectorable exhaust nozzle. 4,000,854, Cl. 239-265.350.
Kondo, Fumio: *See*—
Ito, Masahiko; Wada, Hiromichi; Kondo, Fumio; and Kai, Fukio, 4,001,035.
Kondo, Shinichi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,001,208.
Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Gas pressure device for driving operating means in a camera. 4,001,851, Cl. 354-266.000.
Kongsgaarden, Ole Andreas: *See*—
Bruff, William; and Kongsgaarden, Ole Andreas, 4,001,488.
Konishiroku Photo Industry Co., Ltd.: *See*—
Nakajima, Tomio; Habu, Teiji; Sakamoto, Eiichi; Yamada, Hiroshi; Mitsui, Katsuhide; and Hayashi, Eisaku, 4,001,021.
Koo, Tuh-Kai, to NCR Corporation. Method of fabricating an isolated p-n junction. 4,001,050, Cl. 148-1.500.
Koontz, Donald Eldridge; and Landau, Uziel, to Bell Telephone Laboratories, Incorporated. Method of electroplating precious metals in localized areas. 4,001,093, Cl. 204-15.000.
Kopp, Joseph N.: *See*—
Brown, Lloyd H.; Eftax, Daniel S. P.; and Kopp, Joseph N., 4,000,770.
Koppens, Leonardus Josephus, to U.S. Philips Corporation. Method of manufacturing a ceramic ferromagnetic object. 4,001,363, Cl. 264-61.000.
Koppers Company, Inc.: *See*—
Grosick, Herbert A., 4,001,347.
Kordewick, Carl. Security grille. 4,000,590, Cl. 52-106.000.
Kornfeld, Edmund C.: *See*—
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,001,242.
Korrenn, Heinz; and Voll, Horst, to Kugelfischer Georg Schafer & Co. Combined bearing. 4,000,559, Cl. 308-35.000.
Kosakowski, Henry R., to Bendix Corporation, The. Precision capacitance to digital conversion system. 4,001,813, Cl. 340-347.00R.
Kosower, Edward M.; and Kosower, Nechama S., to Polymer Sciences Corporation. Cyclopropane derivatives and use thereof as cell membrane mobility agents. 4,001,428, Cl. 424-307.000.
Kosower, Nechama S.: *See*—
Kosower, Edward M.; and Kosower, Nechama S., 4,001,428.
Kosslakoff, Nicolas: *See*—
Huber, Ulrich; Kosslakoff, Nicolas; and Vaterlaus, Bruno, 4,001,453.
Kostelnicek, Richard J.: *See*—
Dawson, Charles R.; and Kostelnicek, Richard J., 4,001,774.
Kotera, Masao: *See*—
Matsui, Takeshi; Hinachi, Matatoyo; and Kotera, Masao, 4,001,823.
Kottsieper, Edward: *See*—
Haas, Edgar; and Kottsieper, Edward, 4,001,645.
Kovac, James J., to Goodyear Aerospace Corporation. Disk brake for reinforced drive key member. 4,000,791, Cl. 188-71.500.
Kovacic, Theodore J.: *See*—
Finucane, Thomas P.; Kovacic, Theodore J.; and Wisler, John R., 4,001,448.
Kovar, Robert F.; and Arnold, Fred E., to United States of America, Air Force. Substituted phenyl-benzimidazo compounds. 4,001,268, Cl. 260-309.200.
Kozacka, Frederick J., to Chase-Shawmut Company, The. Electric fuse for elevated circuit voltages. 4,001,749, Cl. 337-244.000.
Kozlov, Leonid Leonidovich: *See*—
Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.
Kraemer & Grebe GmbH & Co KG Maschinen- und Modellfabrik: *See*—
Grebe, Ludwig; and Grebe, Reiner, 4,000,861.
Kraft, Erich: *See*—
Puritz, Ernst; and Kraft, Erich, 4,000,774.
Kramer, Charles E.; and Tiger, Menachem, to G. D. Searle & Co. Apparatus and method for preparing, diluting and replicating laboratory samples. 4,000,976, Cl. 23-259.000.
Krasnobajew, Victor: *See*—
Jaeggi, Kurt; Krasnobajew, Victor; Weber, Peter; and Wild, Jost, 4,001,437.
Kraus, Helmut, to Siemens Aktiengesellschaft. Liquid jet recorder. 4,001,839, Cl. 346-75.000.
Kravitz, Bernard L.; and Seaton, George R., to Dionics, Inc. Monolithic, junction isolated photrac. 4,001,866, Cl. 357-39.000.
Kravitz, Bernard L.; and Seaton, George R., to Dionics, Inc. Semiconductive devices with integrated circuit switches. 4,001,867, Cl. 357-39.000.
Krebs Engineers: *See*—
Melin, Deering D., Jr.; and Grieve, Donald F., 4,000,991.
Kreeger, Elsmer W.: *See*—
Sanders, Ellsworth E.; and Kreeger, Elsmer W., 4,000,817.
Kreighbaum, William E., to Mead Johnson & Company. Alkanesulfonamido triphenylethylenes. 4,001,229, Cl. 260-247.10R.
Kreissl, Ernst; Vahle, Erwin; and Uhlig, Hans, to Singer Company, The. Skip stitch mechanism for sewing machines. 4,000,706, Cl. 112-221.000.
Krespan, Carl G.: *See*—
England, David C.; and Krespan, Carl G., 4,001,319.
Krimm, Heinrich: *See*—
Freitag, Dieter; Haberland, Ulrich; and Krimm, Heinrich, 4,001,183.
Kroebig, Helmut L.; and Riha, Frank J., III, to United States of America, Air Force. Heat pipe system. 4,000,776, Cl. 165-32.000.
Kruhler, Walter-Wolfgang: *See*—
Danielmeyer, Hans-Gunter; Jeser, Jean Pierre; Kruhler, Walter-Wolfgang; Thiemann, Karl-Heinz; and Huber, Gunter, 4,001,704.

Krupka, Dan Charles, to Bell Telephone Laboratories, Incorporated. Fabrication of a self-aligned mirror on a solid-state laser for controlling filamentation. 4,001,719, Cl. 331-94.50H.

Krupp, Ernest E. Center device. 4,000,669, Cl. 82-33.00R.

Krutak, James J., Sr.; Haase, Jan R.; and Landholm, Richard A., to Eastman Kodak Company. Magenta image-providing phenylazonaphthyl dues containing a morpholinyl of piperidine radical. 4,001,204, Cl. 260-152.000.

Kubota, Tatsushi; and Fujiwara, Akinori, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seat belt buckle switch having slidable actuator and bridging contact wire. 4,001,532, Cl. 200-61.58B.

Kudo, Mitsuhiro: *See—*
Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, 4,001,481.

Kugelfischer Georg Schafer & Co.: *See—*
Korrenn, Heinz; and Voll, Horst, 4,000,559.

Kukolja, Stjepan P.; and Lammert, Steven R., to Eli Lilly and Company. Cephalosporin cleavage process. 4,001,239, Cl. 260-243.00C.

Kulbida, Ihor: *See—*
Hatch, Gilbert J.; Johnson, Richard C.; and Kulbida, Ihor, 4,001,541.

Kumakawa, Shiro: *See—*
Hamana, Isao; Fujiwara, Yoshio; and Kumakawa, Shiro, 4,001,479.

Kunes, James J.: *See—*
Lingenfelter, Robert C.; Moore, Curtis L.; and Kunes, James J., 4,001,644.

Kurata, Kazuhiro; Honma, Kozi; Ogirima, Masahiko; Ono, Yuichi; and Keikoin, Yoshiteru, to Hitachi, Ltd.; and Hitachi Electronics Co., Ltd. Epitaxial growth device. 4,000,716, Cl. 118-5.000.

Kure-Jensen, Jens: *See—*
Davis, Mark A.; Eggenberger, Markus A.; and Kure-Jensen, Jens, 4,001,654.

Kurihara, Yasutoshi: *See—*
Miyoshi, Tadahiko; and Kurihara, Yasutoshi, 4,001,859.

Kurimoto, Hiroshi: *See—*
Sugafuji, Akira; Kurimoto, Hiroshi; and Takase, Tadaaki, 4,000,981.

Kurisaki, Konomu: *See—*
Sugimoto, Michio; Yamamoto, Fumitada; Honna, Kosaku; Kurisaki, Konomu; Sugahara, Hirozo; Watanabe, Kiyoshi; Fujimoto, Yasuo; and Ryu, Syoji, 4,001,223.

Kurita, Takaji: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.

Kurk, Kenneth G.; and Kilbride, Robert S., to Moorman Manufacturing Company. Method and apparatus for assembling layers of packages on a pallet. 4,000,820, Cl. 214-6.0DK.

Kurokawa, Fuminori, to Diesel Kiki Co., Ltd. Fuel injection governor. 4,000,728, Cl. 123-140.00R.

Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, to Teijin Limited. Process for the preparation of 1,4-diacetoxycyclopent-2-ene. 4,001,308, Cl. 260-491.000.

Kurtz, Bernard; and Spizzo, Ermes, to Les Ateliers de Constructions Mecaniques; and C. A. Holweg S.A. Method and means for winding pre-cut bags to form rolls. 4,000,864, Cl. 242-59.000.

Kurtzbein, Earl D. Wave and current operated power generating device. 4,001,596, Cl. 290-53.000.

Kusano, Kuniyuki: *See—*
Ikechi, Masai; and Kusano, Kuniyuki, 4,001,857.

Kutz, Norman J.: *See—*
Morrow, James G., Sr.; Pech, David J.; and Kutz, Norman J., 4,000,784.

Kwarsick, Edmund J.: *See—*
Noren, Oscar B.; and Kwarsick, Edmund J., 4,001,755.

Kyburz, Rolf, to Ciba-Geigy AG. Process for crosslinking hydrophilic colloids using vinyl substituted, SO_2 containing, amine salt. 4,001,201, Cl. 260-117.000.

Kyker, Glendon D.: *See—*
Richter, Sidney B.; and Kyker, Glendon D., 4,001,179.

Kyodo Insatsu Kabushiki Kaisha: *See—*
Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, 4,001,062.

Labofina S.A.: *See—*
Camerman, Philippe Jean Andre, 4,001,342.

Laboratorios Made, S.A.: *See—*
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,001,414.

Lachman, Irwin M.: *See—*
Frost, Rodney I.; Lachman, Irwin M.; and Rieth, Paul H., 4,001,028.

Lacotte, Jean Pierre, to Thomson-Brandt. Method apparatus and record for distributing information in the form of color images. 4,001,874, Cl. 358-2.000.

La Force, Phil D.: *See—*
Fukumoto, Akiharu; and La Force, Phil D., 4,000,613.

Laing, Nikolaus. Rotary heat exchanger. 4,000,777, Cl. 165-86.000.

Laing, Nikolaus. Temperature-control system with rotary heat exchangers. 4,000,778, Cl. 165-86.000.

Lally, John Anthony: *See—*
Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, 4,001,084.

Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., to American Petroscience Corporation. Acoustic telemetry system for oil wells utilizing self generated noise. 4,001,773, Cl. 340-18.0LD.

Lammert, Steven R.: *See—*
Kukolja, Stjepan P.; and Lammert, Steven R., 4,001,239.

Landau, Uziel: *See—*
Koontz, Donald Eldridge; and Landau, Uziel, 4,001,093.

Landholm, Richard A.: *See—*
Krutak, James J., Sr.; Haase, Jan R.; and Landholm, Richard A., 4,001,204.

Lane, L. Jubin: *See—*
Chambers, George S.; and Lane, L. Jubin, 4,001,712.

Langbein-Pfanhauser Werke AG: *See—*
Schulze-Berge, Klaus, 4,001,470.

Langeliers, Roger W.: *See—*
Langeliers, Walter J.; and Langeliers, Roger W., 4,000,953.

Langeliers, Walter J.; and Langeliers, Roger W., to Concrete Curb Inlets Co. Concrete catch basin with spring retained manhole cover. 4,000,953, Cl. 404-5.000.

Lankes, Richard George, Jr., to Borden, Inc. Ink containing methylenedisalicylic acid and method for offset printing. 4,001,027, Cl. 106-23.000.

Lantos, Elemer: *See—*
Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.

Lantzsch, Reinhard; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for preparing 4-amino-2,2,6,6-tetramethyl piperidine. 4,001,250, Cl. 260-293.520.

Larsen, Carl Ib Peder, to Haldex Aktiebolag. Apparatus for operation selector circuits, especially tariff selector circuits in electronically operated taximeters. 4,001,560, Cl. 235-151.320.

Larson, Lawrence L.: *See—*
Ruger, William B.; and Larson, Lawrence L., 4,000,575.

Lassau, Christian: *See—*
Gaillard, Jean; and Lassau, Christian, 4,001,343.

Lattmanig, Viktor: *See—*
Schmid, Peter-Jens; and Lattmanig, Viktor, 4,000,818.

Lauraitis, Kristina N., to Babcock & Wilcox Company, The. Composite golf club shaft. 4,000,896, Cl. 273-80.00R.

Lausman, Thomas Clifford: *See—*
Wang, Chih Chun; Lausman, Thomas Clifford; and Bates, Ronald Frank, 4,001,099.

Lavedrine, Marcel: *See—*
Pace, Henri; Lavedrine, Marcel; and Berdou, Jean, 4,001,621.

Laver, Myron B.: *See—*
Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,200.
Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,401.

Lavery, Lawrence P.; and Shuey, David R., to Xerox Corporation. Amplifier for use in a document scanning system. 4,001,500, Cl. 358-282.000.

La Via, Anthony Laurence; and Hill, John Anthony, to E. R. Squibb & Sons, Inc. Sweetening compositions. 4,001,455, Cl. 426-548.000.

Lawrence Brothers Inc.: *See—*
Newlon, Robert L., 4,000,540.

Lawrence Peska Associates, Inc.: *See—*
Bruscemi, Frank, 4,000,736.
Flores, Raul, 4,000,901.
Woods, Walter, 4,000,523.

Lear Siegler, Inc.: *See—*
Inman, Harold W., 4,000,531.

Leatherman, Alfred F.: *See—*
Heller, William C., Jr.; and Leatherman, Alfred F., 4,000,760.

Lebet, Jean-Pierre; and Ducommun, Joel, to Baumgartner Papiers S.A. Device for controlling composite cigarette filter rods. 4,001,579, Cl. 250-223.00R.

Leblanc, Conrad L., to Foster Grant Co., Inc. Case for clip-on sunglasses. 4,000,810, Cl. 206-5.000.

Le Carvennec, Francois: *See—*
Bied-Charreton, Philippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,564.
Bied-Charreton, Phillippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,563.
d'Auria, Luigi; Huignard, Jean-Pierre; Reboul, Jean Philippe; and Le Carvennec, Francois, 4,001,635.

Lech, Joseph: *See—*
McNeill, William; Lech, Joseph; Haugsjaa, Paul; and Regan, Robert, 4,001,631.

Lee, Charles D., Jr., to Parks-Cramer Company. Textile yarn spinning machine with supply strand interruption. 4,000,603, Cl. 57-87.000.

Lee, Henry L., Jr.; and Orlowski, Jan A. Dental sealant for amalgam restorations. 4,001,483, Cl. 526-270.000.

Lee, Sung In. Texturized acetate yarn and method of manufacture. 4,000,604, Cl. 57-153.000.

Leesona Corporation: *See—*
Elmore, Glenn V.; and Tanner, Howard A., 4,001,039.
Gotham, Stanley T., 4,000,860.

Leesona Plastics Machinery Ltd.: *See—*
Fleetwood, William, 4,000,670.

Le Gallais, Jacques J., to Societe Controle Bailey. Variable control current generator arrangement. 4,001,662, Cl. 318-564.000.

Legate, Alvin C.: *See—*
Ramberg, Harold C.; and Legate, Alvin C., 4,001,643.

Lehmann, Cyrill George. Cue-game and sliding disk for same. 4,000,900, Cl. 273-126.00R.

Lehmann, Gunter: *See—*
Diem, Hans; Libowitzky, Herbert; Matthias, Guenther; Dudeck, Christian; and Lehmann, Gunter, 4,001,337.

Leigh Products, Inc.: *See*—
Malott, Richard C., 4,000,688.

Leland Stanford Junior University, The Board of Trustees of: *See*—
Albanese, Andres; and Quate, Calvin F., 4,001,577.

Lemaire, Francis: *See*—
Blin, Marie Francoise; Gaussens, Gilbert; and Lemaire, Francis, 4,001,462.

LeMaitre, Jacques: *See*—
Delmon, Bernard; LeMaitre, Jacques; and Bulens, Michel, 4,001,362.

Lemin, Denis Ronald: *See*—
Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, 4,000,970.

Le Mouee, Theodore: *See*—
Germond, Jean-Claude; Le Mouee, Theodore; Marchal, Paul; Petit, Michel; and Vertut, Jean, 4,000,819.

Lenntoft, Bo Nils Konrad, to Sintab Swedinventor AB. Tubular belt conveyor. 4,000,809, Cl. 198-819.000.

Leonhardt, Horst M. Flammable thermoplastic cement. 4,001,152, Cl. 260-18.00N.

Le Parquier, Guy, to Thomson-CSF. Recording apparatus coding circuit for an image signal and corresponding decoding circuit. 4,001,875, Cl. 358-4.000.

Lepel High Frequency Laboratories, Inc.: *See*—
Rossnick, Melvin, 4,001,725.

Les Ateliers de Constructions Mecaniques: *See*—
Kurtz, Bernard; and Spizzo, Ermes, 4,000,864.

Les Fils d'Auguste Scheuchzer S.A.: *See*—
Scheuchzer, Fredy; Buhler, Fritz; and Chiesa, Alfred, 4,000,699.

Letchworth, Peter E.; and Weil, Edward D., to Stauffer Chemical Company. Phosphonate synergists. 4,001,405, Cl. 424-210.000.

Leung, Steve Ka-Lai: *See*—
Denny, William Michael; Hagen, Russell Louis; and Leung, Steve Ka-Lai, 4,001,699.

Lever Brothers Company: *See*—
Curry, Kenneth Vasey; and Sahir, Ahamado Ismail, 4,001,392.

Levine, Seymour, to United States of America, Air Force. Mechanical retention system for use with caseless ammunition. 4,000,697, Cl. 102-38.000.

Levis, Peter Stanley; and Shepherd, Geoffrey, to Ferranti, Limited. Signal processing apparatus. 4,001,555, Cl. 235-150.530.

Lewis, Donald J.: *See*—
Thibodaux, Joseph G., Jr.; and Lewis, Donald J., 4,000,682.

Lewis, Robert E., to Schick Incorporated. Electric shaver operable from a wide range of supply voltages. 4,001,668, Cl. 323-19.000.

Lewis, William Dein, to Du Pont de Nemours, E. I., and Company. Friction measuring apparatus. 4,000,641, Cl. 73-9.000.

Ley, Kurt; Seng, Florin; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. 3-Amino-1,2,4-benzotriazine-1,4-di-N-oxide compositions and method of using same. 4,001,410, Cl. 424-249.000.

Ley, Kurt: *See*—
Seng, Florin; and Ley, Kurt, 4,001,324.

L'Hommedieu, Jesse H.: *See*—
Fischman, Martin; and L'Hommedieu, Jesse H., 4,001,641.

Li, Norman N.; Hucal, Taras; and Cahn, Robert P., to Exxon Research and Engineering Company. Demulsification process. 4,001,109, Cl. 210-22.00R.

Li, Yao Tzu. Zero stiffness taut ribbon rotary suspension systems. 4,000,659, Cl. 73-514.000.

Liang, Robert Chao-Chuin, to International Business Machines Corporation. Latching driver circuit and structure for a gas panel display. 4,001,868, Cl. 357-46.000.

Libowitzky, Herbert: *See*—
Diem, Hans; Libowitzky, Herbert; Matthias, Guenther; Dudeck, Christian; and Lehmann, Gunter, 4,001,337.

Lieb, Carl; and Piaskowski, Edward J., to Babcock & Wilcox Company, The. Vapor generator. 4,000,720, Cl. 122-510.000.

Liebler, Marvin E.; and Lum, Eugene J., to Westinghouse Electric Corporation. Helical resistor and method for assembling. 4,001,761, Cl. 338-304.000.

Liepa, Alexander L., to Procter & Gamble Company, The. Meat analog. 4,001,441, Cl. 426-104.000.

Lim, Jin-Twan: *See*—
Cheng, Rudolph Hon-Ching; and Lim, Jin-Twan, 4,001,735.

Limeres, Ricardo; and Osborn, Alfred, to Ideal Corporation. Flasher switch vane structure. 4,001,747, Cl. 337-136.000.

Lin Offshore Engineering, Inc.: *See*—
Chow, Philip Y., 4,000,624.

Lindemann, Martin K., to Chas. S. Tanner Co. Crushed foam-backed fabrics and emulsions for producing the same. 4,001,158, Cl. 260-29.6TA.

Lindemann, Martin K., to Chas. S. Tanner Co. Aqueous emulsion adhesives based on C_2-C_4 ethers of N-methylol amides copolymerized with vinyl esters in the presence of hydroxy functional protective colloids. 4,001,160, Cl. 260-29.6WA.

Linden, Sven-Erik; and Forsberg, Nils Gunnar Krister, to Elektriska Svetsningsaktiebolaget. Chain making apparatus. 4,000,606, Cl. 59-16.000.

Lindig, Otto; and Sack, Werner, to Jenaer Glaswerk Schott & Gen. Low working temperature reed glasses. 4,001,741, Cl. 335-153.000.

Lindlof, James A.: *See*—
Tungseth, Barry F.; and Lindlof, James A., 4,001,167.

Lindquist, Gunnar: *See*—
Wallin, Erik W.; and Lindquist, Gunnar, 4,001,827.

Lindstrom, K. Hakan: *See*—
Erikson, Ernst G.; and Lindstrom, K. Hakan, 4,000,712.

Lingenfelter, Robert C.; Moore, Curtis L.; and Kunes, James J., to Westinghouse Electric Corporation. Sudden pressure relay having seismic protection. 4,001,644, Cl. 317-14.00G.

Lipo, Thomas A., to General Electric Company. Regulating the torque of an induction motor. 4,001,660, Cl. 318-227.000.

Littman, Stanley: *See*—
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,001,367.

Litton Systems, Inc.: *See*—
Burke, Robert Virgil; and Hester, Thomas Eugene, 4,001,537.

Ljung, Sten Rune. Insert for the furnaces of boilers. 4,000,735, Cl. 126-361.000.

Lo, David S.; and Paul, Maynard C., to Sperry Rand Corporation. Magneto-inductive readout of cross-tie wall memory system using hard axis drive field and noise cancelling sense line. 4,001,795, Cl. 340-174.0TF.

Lockheed Missiles & Space Company, Inc.: *See*—
Momyer, William R., 4,001,043.

Loev, Bernard: *See*—
Bowman Van Hoeven, Helene E.; Brenner, L. Martin; and Loev, Bernard, 4,001,241.

Loh, Jack C.: *See*—
Marwell, Edward M.; and Loh, Jack C., 4,001,688.

Lohmann, Frank, to Ciba-Geigy Corporation. Stable solutions of fluorescent brighteners. 4,001,138, Cl. 252-301.270.

Lombardo, Dominick A. Lighting devices. 4,001,803, Cl. 340-248.00B.

Lone Star Container Sales Corporation: *See*—
Hardison, Jerry C.; and Gray, Laverne E., 4,000,811.

Long, Edward C., to Beckman Instruments, Inc. Liquid scintillation solution. 4,001,139, Cl. 252-301.170.

Longo, John M., to Exxon Research and Engineering Company. Process for the desulfurization of flue gas. 4,001,375, Cl. 423-244.000.

Lonseth, Palmer; Selkirk, Neil Robertson; and Panter, Hubert Gerald, to Canadian General Electric Company Limited. Grounding of outer winding insulation to cores in dynamoelectric machines. 4,001,616, Cl. 310-45.000.

Lonza Ltd.: *See*—
Moulin, Francois; and Boosen, Karl-Josef, 4,001,255.

L'Orange, Raul, to Blendax-Werke R. Schneider GmbH & Co. Means for caries prophylaxis. 4,001,393, Cl. 424-52.000.

Loucks, Wesley T., Sr., to William F. Shepherd, Inc. Electromechanical interlock device for a vending machine. 4,000,800, Cl. 194-9.00R.

Loughley, William A.: *See*—
Tecco, Charles; and Loughley, William A., 4,000,839.

Love, David A. Electronic vibrato system. 4,000,676, Cl. 84-1.250.

Lucas Industries Limited: *See*—
Orloff, George, 4,000,755.

Lucas, Roland T., to St. Luke's Hospital Research Foundation, Inc. Manifold report form and methods for using the same. 4,000,916, Cl. 282-11.50A.

Lucchesi, Benedict R., to University of Michigan, The Regents of the. Novel quaternary salts and method. 4,001,327, Cl. 260-567.60M.

Lucek, John R.; and Palen, Vernon B., to General Electric Company. Centrifugally casting hollow glass body around vapor shield. 4,000,999, Cl. 65-49.000.

Lucking, Hans Joachim: *See*—
Maass, Gunther; Lucking, Hans Joachim; Sattlegger, Hans; and Rudolph, Karl-Heinz, 4,001,168.

Lugay, Joaquin Castro: *See*—
Kim, Myung Ki; and Lugay, Joaquin Castro, 4,001,459.

Lum, Eugene J.: *See*—
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Lydiksen, George C., to Simplex Filler Co. Bottom-up container-filling machine. 4,000,765, Cl. 141-181.000.

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Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,001,367.

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Mack, Alfred; and Schweitzer, Cameron Charles, to RCA Corporation. Method and apparatus for compensation of doppler effects in satellite communication systems. 4,001,690, Cl. 325-4.000.

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Maddox, Ronnie Joseph, to Electroprint, Inc. Methods and apparatus for cleaning paper in a high speed electrostatic printing apparatus. 4,001,838, Cl. 346-153.000.

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Magill, Hugh; and Herwynen, John Alfred. Wall partition system and components thereof. 4,000,596, Cl. 52-481.000.

Maguire, Edward John, Jr., to Procter & Gamble Company, The. Automatic dishwashing detergent composition. 4,001,132, Cl. 252-105.000.

Mahon, Joseph J., to Singer Company, The. Percentage timer. 4,001,529, Cl. 200-39.00R.

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Makepeace, Charles E. Process for making metal pipe. 4,001,054, Cl. 148-16.500.

Makino, Shinji: *See—*
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Malchow, Max Edward: *See—*
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Malcolm, Bruce G.; and Dawson, William P. Direct contact rotary attenuator. 4,001,736, Cl. 333-81.00A.

Malen, Charles; and Desnoyers, Pierre, to Science Union et Cie, Societe Francaise de Recherche Medical. Thiazolyl benzoic acid compounds. 4,001,420, Cl. 424-270.000.

Malott, Bernard: *See—*
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Malott, Richard C., to Leigh Products, Inc. Ventilator for roof ridge. 4,000,688, Cl. 98-42.00A.

Maltman, William Ramsey; and Howard, Colin Robert, to Pilkington Brothers Limited. Manufacture of float glass. 4,001,476, Cl. 428-209.000.

Manabe, Osamu; and Nara, Kenichi, to Osaka City. Manufacture of aromatic amino compounds. 4,001,313, Cl. 260-508.000.

Mandock, Richard F., to Eclipse, Inc. Primary flame safeguard system. 4,000,961, Cl. 431-2.000.

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Sims, Claude C., 4,001,765.

Marion, Frank A.; and McSpadden, Hugh J., to Universal Propulsion Co. Heat protective material and method of making the material. 4,001,126, Cl. 252-62.000.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,001,175, Cl. 260-45.70S.

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Strom, Leslie S., 4,000,915.

Markofsky, Sheldon Boris; and Block, Jacob, to W. R. Grace & Co. Scale inhibiting process. 4,001,134, Cl. 252-180.000.

Marks, Robert G., to Itek Corporation. Toner dispensing apparatus. 4,000,833, Cl. 222-105.000.

Marmo, Don; and Rocco, Frank Louis, to International Flavors & Fragrances Inc. Flavor composition for use in orally utilizable compositions. 4,001,438, Cl. 426-96.000.

Marquez, Joseph A.: *See—*
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Martin, James Scott; and Cook, Robert E., to Charles Machine Works, Inc., The. Pushing or pulling apparatus for pipe, rod or the like. 4,000,879, Cl. 254-29.00R.

Martin, Jean-Marc: *See—*
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Maruyama, Tatsuo; and Sasaki, Hiroshi, to Kokusai Denshin Denwa Kabushiki Kaisha. Asynchronous delay circuit. 4,001,611, Cl. 307-293.000.

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Marwell, Edward M.; and Loh, Jack C., to Curtis Instruments, Inc. Coulometer with end of integration color change indicator. 4,001,688, Cl. 324-182.000.

Marwil, Stanley J.: *See—*
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Marzoli, Angelo, to F. Lli Marzoli & C. S.p.A. Installation for metering textile fibers. 4,000,541, Cl. 19-81.000.

Masaki, Mitsuo; Matsunami, Satoshi; Fuzimura, Susumu; and Okimoto, Kiyomi, to UBE Industries, Ltd. Hexakis(2-pyridylthio)-tetrazinc monooxide. 4,001,240, Cl. 260-270.00K.

Maschinenfabrik Augsburg-Nurnberg AG: *See—*
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Ottl, Adolf; Dost, Fredy; and Breindl, Otto, 4,000,730.

Maser, Kenneth R., to United States of America, Interior. Remote sealing of mine passages containing flowing water. 4,000,621, Cl. 61-35.000.

Massey-Ferguson Industries Limited: *See—*
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Masuda, Keiji; Kizawa, Hidenori; and Otaki, Yasuhiko, to Nippon Soda Company Limited. Process for producing nicotinic acid. 4,001,257, Cl. 260-295.50R.

Mathamel, Flavius A.: *See—*
Wisner, Daniel A.; Mathamel, Flavius A.; and Schmalzriedt, Truman T., 4,001,665.

Matlock, William C.; and Somlo, Patricia K. Solar energy converter. 4,000,734, Cl. 126-271.000.

Matner, Martin; Perrey, Hermann; and Schwinum, Ernst, to Bayer Aktiengesellschaft. Stable heat-sensitive latex mixtures. 4,001,162, Cl. 260-29.6SQ.

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Matsumoto Kiko Co., Ltd.: *See—*
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Matsumoto, Kouichi, to Matsumoto Kiko Co., Ltd. Slowdown escaping apparatus. 4,000,881, Cl. 254-157.000.

Matsumura, Yasuo; Kishimoto, Soichiro; and Okazaki, Saburo, to Japan Exlan Company Limited. Process for producing carbon fibers having excellent physical properties. 4,001,382, Cl. 423-447.100.

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Matsushita Electric Industrial Co., Ltd.: *See—*
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Fukuda, Masataro; Iwaki, Tsutomu; and Kobayashi, Yoshihiro, 4,001,040.
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Mattalia, Gabriele, to Serono Laboratories, Inc. 2-Thiol-4,5-diphenyloxazole S-derivatives. 4,001,228, Cl. 260-247.10M.

Matthias, Guenther: *See—*
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Mau, Gunter; Jacobsen, Gunter; and Brandes, Erich, to Hoechst Aktiengesellschaft. Process for compressing ketene. 4,001,332, Cl. 260-585.500.

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Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Danielmeyer, Hans-Gunter; Jeser, Jean Pierre; Kruhler, Walter-Wolfgang; Thiemann, Karl-Heinz; and Huber, Gunter, 4,001,704.

Max, Ruf, to Audi NSU Auto Union Aktiengesellschaft. Device for low-warp hardening of annular sealing members. 4,000,887, Cl. 266-274.000.

Maxton Manufacturing Company: *See—*
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Maxwell, Robert Arthur; and Copp, Frederick Charles, to Burroughs Wellcome Co. Quaternary ammonium compounds useful as antifibrillatory agent. 4,001,433, Cl. 424-329.000.

May, Michael G. Externally ignited four cycle internal combustion engine. 4,000,722, Cl. 123-30.00D.

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McCann, Elrey L., III, to Du Pont de Nemours, E. I., and Company. Catalyst preparation. 4,001,143, Cl. 252-462.000.

McCardle, Arthur, Jr.; Wright, John J.; and Baugh, Jarod L., to General Electric Company. Variable area, load balancing nozzle. 4,000,611, Cl. 60-230.000.

McClintock, Richard D. Exposure control system. 4,001,844, Cl. 354-51.000.

McCord, Andrew T.; Wagner, Louis E.; and Reese, Theodore J., to Chem-Trol Pollution Services, Inc. Process for making low alkali cement clinker. 4,001,031, Cl. 106-100.000.

McCormick, Ronald O., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming a stream feeder. 4,001,542, Cl. 219-117.00R.

McCracken, Harry J.: *See—*
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McDonald, John C.; Henrickson, Gary C.; Taylor, Alan K.; and Settle, William A., to TRW Inc. Remote office message metering system. 4,001,509, Cl. 179-7.10R.

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McGraw-Edison Company: *See—*
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McHard, James A.: *See—*
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McIlvaine, Paul M.: *See—*
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McInnes, Gordon J.: *See—*
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McIntosh, Duane E., to General Motors Corporation. Method and apparatus for coding and decoding digital information. 4,001,811, Cl. 340-347.0DD.

McKenzie, Roy Victor W.: *See—*
Howie, David Malcolm; McKenzie, Roy Victor W.; and Snape, James Ronald, 4,001,760.

McNaney, Joseph T. Light optic data handling systems. 4,000,939, Cl. 350-160.00R.

McNeil Corporation: *See—*
Conery, William James; and Smith, Donald D., 4,001,533.

McNeill, Charles T.; and Silva, Melba F., to No-Joint Concrete Pipe Co. Apparatus and method for forming a cementitious conduit in situ. 4,001,358, Cl. 264-33.000.

McNeill, William; Lech, Joseph; Haugsjaa, Paul; and Regan, Robert, to GTE Laboratories Incorporated. Adjustable length center conductor for termination fixtures for electrodeless lamps. 4,001,631, Cl. 315-39.000.

McNeilly, Clyde E., to United States of America, Energy Research and Development Administration. Automatic range selector. 4,001,683, Cl. 324-115.000.

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Mead Corporation, The: *See—*
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Meardi, Pietro. Anchor rod for walls, bulkheads and the like. 4,000,623, Cl. 61-39.000.

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Megumi, Kouiti; Nagatsuma, Kazuyuki; Kashiwada, Yasutoshi; and Furuhata, Yoshio, to Agency of Industrial Science & Technology. Process of preparing single crystals of strontium barium niobate. 4,001,127, Cl. 252-62.900.

Mehrbrodt, Alfonso W.; Mog, Walter F.; and Brunnett, Carl J., to Picker Corporation. Scintillation scanner. 4,001,580, Cl. 250-363.00S.

Meiling, Gerald S.; and Cauge, Thomas P., to Signetics Corporation. Method of making metal oxide semiconductor structures using ion implantation. 4,001,048, Cl. 148-1.500.

Meininger, Fritz; Schlafer, Ludwig; and Kallay, Maria, to Hoechst Aktiengesellschaft. Dyeing cellulose with aminonaphthyl azobenzene vinyl type reactive dyes. 4,000,966, Cl. 8-1.00E.

Meisenheimer, Daniel T., Jr. Fluid reservoir device with fill means, level indicator means and pressure relief means. 4,000,758, Cl. 138-31.000.

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Menard, Maurice C., to United Technologies Corporation. Pressurized fuel cell power plant. 4,001,041, Cl. 429-17.000.

Mennicke, Winfried; Suchanek, Peter; and Vogt, Peter F., to Bayer Aktiengesellschaft. Metal complex dyestuffs. 4,000,965, Cl. 8-26.000.

Menzel, Klaus, to Bendix Machine Tool Corporation. Two-speed mechanical quill feed and spindle drive mechanism for a machine tool. 4,000,661, Cl. 74-89.150.

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Merchant, Stanley R.: *See—*
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Merck & Co., Inc.: *See—*
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Miller, Elwood M., to General Electric Company. Process for producing gamma-butyrolactone. 4,001,282, Cl. 260-343.600.

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Mitsui Toatsu Chemicals, Incorporated: *See—*
Toyama, Teruhiko; and Takasawa, Yoshio, 4,001,004.
Mittleman, Herbert, to Baxter Travenol Laboratories, Inc. Injection site. 4,000,740, Cl. 128-214.00R.
Miura, Shuzi: *See—*
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, 4,001,308.
Miyamoto, Koichi: *See—*
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,000,942.
Miyamura, Koji: *See—*
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Miyashita, Kyoichi: *See—*
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Miyasita, Satoru: *See—*
Kanbara, Kenjiro; Hattori, Masayuki; Miyasita, Satoru; Iguchi, Masaaki; and Yoda, Jihei, 4,001,010.
Miyazaki, Ken; Takahashi, Kazutoshi; and Omino, Mamoru, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for monitoring changes of multiple inputs. 4,001,785, Cl. 340-172.500.
Miyazaki, Koshin: *See—*
Noguchi, Teruhisa; Kato, Kimpei; and Miyazaki, Koshin, 4,001,297.
Miyoshi, Jun; Kajikawa, Yoji; Ota, Akira; Asaoka, Junichi; and Kino, Yoshio, to Matsushita Electric Industrial Co., Ltd. Dry cell. 4,001,044, Cl. 429-166.000.
Miyoshi, Tadahiko; and Kurihara, Yasutoshi, to Hitachi, Ltd. Photo coupler. 4,001,859, Cl. 357-19.000.
Mizsak, Stephen A.: *See—*
Argoudelis, Alexander D.; Baczynskyj, Lubomir; and Mizsak, Stephen A., 4,001,267.
Mizukami, Tatsuto: *See—*
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Mizuno, Kazuhiro: *See—*
Funatani, Kiyoshi; Ozaki, Ryosuke; and Mizuno, Kazuhiro, 4,000,628.
Mizuno, Yukio, to Nissan Motor Co., Ltd. Yarn drawing and measuring device of a weaving loom. 4,000,762, Cl. 139-452.000.
Mobil Oil Corporation: *See—*
Chu, Chin-Chiun, 4,001,346.
Johnson, David Emil, 4,001,067.
Plank, Charles J.; and Rosinski, Edward J., 4,001,106.
Sexton, James H.; Patton, Bobbie J.; and Harrell, John W., 4,001,775.
Theissen, Robert J., 4,001,005.
Moen, Alfred M. Flow control aerator. 4,000,857, Cl. 239-428.500.
Mog, Walter F.: *See—*
Mehrbrodt, Alfonso W.; Mog, Walter F.; and Brunnett, Carl J., 4,001,580.
Mohr, Max C.: *See—*
Birch, James D.; Mohr, Max C.; and Waterman, Raymond C., Jr., 4,001,733.
Moioli, Alessandro. Apparatus for designing and testing proper values of parameters relating to supporting hydrodynamically lubricated bearing journals. 4,000,656, Cl. 73-432.00R.
Mojden, Wallace W., to Fleetwood Systems, Inc. Carousel can end feed unit. 4,000,709, Cl. 113-114.0BG.
Mol, Hans C.; Byrne, Leroy H.; and Fassman, Arnold, to Pitney-Bowes, Inc. Cam-operated phasing mechanism for a collator. 4,000,889, Cl. 270-58.000.
Molex Incorporated: *See—*
Olson, Harry W., 4,001,526.
Molin, Alexandr Alexandrovich: *See—*
Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.
Molins Limited: *See—*
McEnery, John, 4,001,562.
Molique, Robert S., to Bendix Corporation, The. Vibratory trough part feeder. 4,000,807, Cl. 198-443.000.
Molloy, Bryan Barnet, to Eli Lilly and Company. Diarylbutanolamines. 4,001,328, Cl. 260-567.60M.
Moltner, Hermann: *See—*
Gerhards, Hans-Dieter; and Moltner, Hermann, 4,000,637.
Momparler, Fred J.: *See—*
Wilson, Michael A.; Gee, Gordon E.; and Momparler, Fred J., 4,001,718.
Momyer, William R., to Lockheed Missiles & Space Company, Inc. Anode moderator for reactive metal electrochemical cells. 4,001,043, Cl. 429-206.000.
Monahan, Earnest M.; Patterson, Garvin W.; and Calle, Jaime, to Honeywell Information Systems, Inc. Priority interrupt mechanism. 4,001,783, Cl. 340-172.500.
Monot, Bernard, to Faiveley S.A. Oblique-displacement sliding door. 4,000,582, Cl. 49-218.000.
Monsanto Company: *See—*
Groves, Warren O.; and Epstein, Arnold S., 4,001,056.
Hershman, Arnold; and Pearson, Anthony J. C., 4,001,213.
Montalvo, Edwin J., Jr. Push/pull valve for two or three way operation. 4,000,685, Cl. 91-469.000.
Monte, Sabastiano: *See—*
Murolo, Giuseppe, 4,001,458.
Montedison Fibre S.p.A.: *See—*
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Montefibre S.p.A.: *See—*
Patron, Luigi; Mazzuco, Pier Luigi; Veneto, Favato; Trevisan, Enzo; and Niero, Ennio, 4,001,485.
Montgomery, Ronald Earl, to Procter & Gamble Company, The. Activation of organic peracids by di-ketones. 4,001,131, Cl. 252-99.000.
Mooradian, Aram: *See—*
Alexander, Ernest John; and Mooradian, Aram, 4,001,270.
Moore, Curtis L.: *See—*
Lingenfelter, Robert C.; Moore, Curtis L.; and Kunes, James J., 4,001,644.
Moorman Manufacturing Company: *See—*
Kurk, Kenneth G.; and Kilbride, Robert S., 4,000,820.
Moppett, Charles E.: *See—*
Celmer, Walter D.; Moppett, Charles E.; Cullen, Walter P.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,001,397.
Morgan, Samuel A., to Sycor, Inc. Flexible disc recorder construction. 4,001,888, Cl. 360-99.000.
Morikawa, Masanobu: *See—*
Tsutsumi, Tadao; Kato, Nobuo; Morikawa, Masanobu; Aoyama, Toshikazu; and Nagai, Kazumi, 4,001,177.
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, to Nippon Electric Company, Ltd. Video mixing and/or keying system. 4,001,498, Cl. 358-160.000.
Morishita, Tsuyoshi; and Yamada, Toshio, to Toyo Kogyo Co., Ltd. Abrasion-resistant sliding material. 4,000,980, Cl. 29-182.500.
Morisue, Kazushige: *See—*
Yamada, Kiyoshi; Morisue, Kazushige; Shimomura, Hiroshi; and Imamura, Yoshio, 4,001,816.
Moriyama, Kiruko: *See—*
Osono, Takashi; Moriyama, Kiruko; Murakami, Keisuke; and Umezawa, Hamao, 4,001,399.
Morozowich, Walter, to Upjohn Company, The. Prostaglandin F 15-monoacrylates. 4,001,306, Cl. 260-488.00R.
Morris, Derek S.; and Braun, Robert M., to United States of America, Army. Fixed format message entry device with electronic storage and editing. 4,001,814, Cl. 340-365.00R.
Morris, John M., to Rexnord Inc. Particulate bed dust collectors. 4,000,995, Cl. 55-282.000.
Morris, Kent C.: *See—*
Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,200.
Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,401.
Morrison, W. Andrew: *See—*
Cargile, William P.; and Morrison, W. Andrew, 4,001,679.
Morrow, James G., Sr.; Pech, David J.; and Kutz, Norman J., to Manitowoc Company, Inc., The. Demountable self-propelled crane transport assembly. 4,000,784, Cl. 180-9.480.

Morton, John L., Jr.: *See*—
Warp, Rick A.; Morton, John L., Jr.; and Azmoon, Majid, 4,000,803.
Morton-Norwich Products, Inc.: *See*—
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Schwan, Thomas J., 4,001,245.
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Knutson, William J.; and Smith, Daniel M., 4,001,711.
Motsinger, James Valery, 4,001,782.
Reed, Francis K., 4,001,714.
Reed, Francis Keith, 4,001,510.
Motsinger, James Valery, to Motorola, Inc. Combined encoder and decoder circuit. 4,001,782, Cl. 340-171.00R.
Mott, George Edward; and Skaggs, Robert Lee, to Texaco Inc. Wave height measuring device. 4,000,646, Cl. 73-170.00A.
Mott, Ludwig: *See*—
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Motz, Herbert: *See*—
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Moulet, Camille, to Crinospital S.p.A. Automatic low throughput metering apparatus for selecting and controlling the flow rate of liquids. 4,001,801, Cl. 340-239.00R.
Moulias, Robert Louis: *See*—
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Moulin, Francois; and Boosen, Karl-Josef, to Lonza Ltd. Process for the production of cyanopyridines. 4,001,255, Cl. 260-294.900.
Moulton, James A., to Rockwell International Corporation. Range-gated moving target signal processor. 4,001,826, Cl. 343-7.700.
Moyse, James Albert: *See*—
Cheetham, Ian; Dunkerley, Kenneth; Greenhaigh, Colin William; Moyse, James Albert; and Newton, David Francis, 4,001,169.
Mrozik, Helmut H., to Merck & Co., Inc. Benzenedisulfonamides as anthelmintic agents. 4,001,406, Cl. 424-228.000.
MSE Corporation: *See*—
Donald, James E.; and Weigt, Gerald I., 4,000,912.
Muchowki, Joseph M.; and Fried, John H., to Syntex (U.S.A.) Inc. 11,12-Difluoromethylene substituted prostanoic and prost-5-cis-enoic acid derivatives. 4,001,295, Cl. 260-468.00D.
Mueller, Anthony A.; Bao, Frank W.; Parker, Stephen D.; and Hummeldorf, James L., to Actus, Inc. Automatic sample changer. 4,001,584, Cl. 250-328.000.
Mueller Co.: *See*—
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Muller, Friedhelm: *See*—
von Bonin, Wulf; Muller, Friedhelm; and Schon, Nikolaus, 4,001,193.
Muller, Ronald M., to United States of America, National Aeronautics and Space Administration. Method and apparatus for measuring web material wound on a reel. 4,001,552, Cl. 235-92.0DN.
Murakami, Keisuke: *See*—
Osono, Takashi; Moriyama, Kiruko; Murakami, Keisuke; and Umezawa, Hamao, 4,001,399.
Murasaki, Hiroshi: *See*—
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.
Murata, Seiichiro: *See*—
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Harada, Koji; and Murata, Seiichiro, 4,000,711.
Murata, Shinji, to Canon Kabushiki Kaisha. Device for detecting a moving object. 4,001,581, Cl. 250-239.000.
Muraviev, Ernest Nikolaevich: *See*—
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983.
Murdock, Robert H., to NEF Systems. Railing construction. 4,000,883, Cl. 256-65.000.
Murolo, Giuseppe, to Monte, Sabastiano; Rejnarowycz, Anya; and Murolo, Giuseppe. Fresh lemon-flavored alcohol beverage and method of preparation. 4,001,458, Cl. 426-592.000.
Murrmann, Helmuth: *See*—
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Murtha, Timothy P.; and Gray, Roy A., to Phillips Petroleum Company. Flame retardants for polymers. 4,001,182, Cl. 260-45.85R.
Musil, Josef: *See*—
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Nagai, Kazumi: *See*—
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Nagaoka, Yoshitomi; and Furuhashi, Michio, to Matsushita Electric Industrial Co., Ltd. Automatic hue-control apparatus for color television receivers. 4,001,879, Cl. 358-28.000.
Nagatsuma, Kazuyuki: *See*—
Megumi, Kouiti; Nagatsuma, Kazuyuki; Kashiwada, Yasutoshi; and Furuhata, Yoshio, 4,001,127.
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, to Elecompack Company Ltd. Apparatus for storing unstacking and delivering articles. 4,000,821, Cl. 214-8.50F.
Najer, Henry; and Pascal, Yves Robert Alain, to Synthelabo. Apovincaldehyde. 4,001,251, Cl. 260-293.530.
Nakabayashi, Shigetoshi: *See*—
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Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Iida, Yoshimitsu. Method of slowing sublimation of sublimable material. 4,001,434, Cl. 424-361.000.
Nakajima, Shin'Ichiro: *See*—
Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Iida, Yoshimitsu, 4,001,434.
Nakajima, Tomio; Habu, Teiji; Sakamoto, Elichi; Yamada, Hiroshi; Mitsui, Katsuhide; and Hayashi, Eisaku, to Konishiroku Photo Industry Co., Ltd. Lithographic development of a lith-type silver halide emulsions containing a benzimidazole. 4,001,021, Cl. 96-66.00R.
Nakakubo, Koichi: *See*—
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Nakano, Gregory: *See*—
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Nakano, Okihiko: *See*—
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Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Katayama, Shigenari; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Aminoalcohols. 4,001,312, Cl. 260-501.180.
Nakatani, Eisaku, to Kansai Paint Company, Ltd. Method of discoloration of metal compounds by irradiation of laser rays. 4,091,095, Cl. 204-157.10R.
Nakayama, Hiroyuki: *See*—
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Nakayama, Takeo: *See*—
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Nakazato, Yoshio; Nakazawa, Masatoshi; Ohashi, Nobuo; and Ito, Yo, to Kawasaki Steel Corporation. Hot-rolled low-carbon steel strip with an excellent press-workability capable of forming smooth pressed surface and a method of making the same. 4,001,052, Cl. 148-12.00C.
Nakazawa, Masatoshi: *See*—
Nakazato, Yoshio; Nakazawa, Masatoshi; Ohashi, Nobuo; and Ito, Yo, 4,001,052.
Nakazono, Ryuichi: *See*—
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Nalco Chemical Company: *See*—
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Nara, Kenichi: *See*—
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Narco Scientific Industries, Inc.: *See*—
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Naro, Rodney L.: *See*—
Skubon, Michael J.; Spiwak, John J.; and Naro, Rodney L., 4,001,468.
Nash, Dudley O.; Beavers, Robert G.; Burge, Joseph C.; Castells, Onofre T. M.; and Parker, Alan I., to General Electric Company. Flight maneuverable nozzle for gas turbine engines. 4,000,610, Cl. 60-230.000.
Nash, Dudley O.: *See*—
Konarski, Mieczyslaw; and Nash, Dudley O., 4,000,854.
Wakeman, Thomas G.; and Nash, Dudley O., 4,000,612.
Nash, Lawrence H., to Kalo Laboratories, Inc. Dialkylammonium-2,4-dichlorophenoxyacetates as plant growth regulators and the method of making same. 4,001,006, Cl. 71-117.000.
National Semiconductor Corporation: *See*—
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Patel, Suman H.; and Jones, Thomas, 4,001,722.
Simone, Richard B., 4,001,567.
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National-Standard Company, Limited: *See*—
Bell, Robert Graham, 4,001,070.
Nauman, Warren David: *See*—
Finley, Richard James; and Nauman, Warren David, 4,000,874.
Nayfa, James E.; and Stanley, Andrew D. Floor cleaning machine with foam dispensing system. 4,000,536, Cl. 15-50.00A.
Naylor, David Charles, to Northern Electric Company Limited. Method and apparatus for the detection of fraudulent toll telephone calls. 4,001,513, Cl. 179-18.0DA.
NCR Corporation: *See*—
Foris, Peter L.; Brown, Robert W.; and Phillips, Paul S., Jr., 4,001,140.
Koo, Tuh-Kai, 4,001,050.
NEF Systems: *See*—
Murdock, Robert H., 4,000,883.
Nelson, Alden W., to Crompton & Knowles Corporation. Screw removing apparatus for vertical extruders. 4,000,554, Cl. 29-252.000.
Nelson, James P., to Standard Oil Company (Indiana). Dimethyl 2,5-dibromoterephthalate esterification. 4,001,188, Cl. 260-75.00H.

Nelson, Norman A., to Upjohn Company, The. 5-Oxa prostaglandin E, analogs. 4,001,296, Cl. 260-468.00D.
Nelson, Theodore M., to United States of America, Air Force. High power microwave radar pulse shaping system. 4,001,821, Cl. 343-5.00R.
Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., to Berkey Photo, Inc. Camera construction. 4,001,848, Cl. 354-196.000.
Nestler, Hans Jurgen: *See—*
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Newlon, Robert L., to Lawrence Brothers Inc. Spring loaded, adjustable walking door hinge. 4,000,540, Cl. 16-151.000.
Newton, Archibald R., III, to Grafo Colloids Corporation. Lubricant for mandrels, forging dies, molds and the like. 4,001,125, Cl. 252-29.000.
Newton, Clifford, to BSG Designs Inc. Polychromatographic dyeing. 4,000,964, Cl. 8-14.000.
Newton, David Francis: *See—*
Cheetham, Ian; Dunkerley, Kenneth; Greenhaigh, Colin William; Moyse, James Albert; and Newton, David Francis, 4,001,169.
Neyer, James U., to Arens Controls, Inc. Hollow knob. 4,000,539, Cl. 16-121.000.
NGK Spark Plug Co., Ltd.: *See—*
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Nicholas, Thomas C., III: *See—*
Fiori, Anthony M.; Fiori, Robert T.; and Nicholas, Thomas C., III, 4,001,882.
Nielsen, Erik C. Fending device for oil containment boom. 4,000,532, Cl. 9-8.00R.
Niero, Ennio: *See—*
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Nihon Denshi Kabushiki Kaisha: *See—*
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Nikki Chemical Co., Ltd.: *See—*
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Ninomiya, Shuichi: *See—*
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Nippon Chemiphar Co., Ltd.: *See—*
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Nippon Electric Company, Ltd.: *See—*
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Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,001,498.
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kayaku Kabushiki Kaisha: *See—*
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Nippon Soda Company Limited: *See—*
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Nippon Soken, Inc.: *See—*
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Matsui, Takeshi; Hinachi, Matatoyo; and Kotera, Masao, 4,001,823.
Nippon Steel Corporation: *See—*
Kanbara, Kenjiro; Hattori, Masayuki; Miyasita, Satoru; Iguchi, Masaaki; and Yoda, Jihei, 4,001,010.
Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, 4,001,007.
Nishikawa, Masao; Toshimitsu, Yoshihiko; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Power steering apparatus for a vehicle. 4,000,785, Cl. 180-143.000.
Nishimoto, Tsunanori: *See—*
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Harada, Koji; and Murata, Seiichiro, 4,000,711.
Nissan Motor Co., Ltd.: *See—*
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Takeuchi, Yasuhisa; and Iizuka, Haruhiko, 4,000,928.
Usui, Hideyuki; and Kimura, Toshimitsu, 4,000,876.
Nitta, Hirotoshi: *See—*
Taketa, Katsumi; Nitta, Hirotoshi; and Sato, Eiichi, 4,001,648.
Nix, Robert J., to Signode Corporation. Manual strapping tool. 4,001,064, Cl. 156-73.600.
No-Joint Concrete Pipe Co.: *See—*
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Noguchi, Kentaro: *See—*
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Noguchi, Masaaki; and Sanda, Shougo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combuston engines. 4,000,731, Cl. 123-191.00S.
Noguchi, Teruhisa; Kato, Kimpei; and Miyazaki, Koshin, to Nippon Soda Company Limited. Thioureidobenzene preparations and uses thereof. 4,001,297, Cl. 260-470.000.
Nomoto, Yoshihisa; Takegami, Shigeru; Nakakubo, Koichi; and Yoneyama, Takao, to Hitachi, Ltd. Temperature-rise preventive apparatus for television receiver parts. 4,001,503, Cl. 358-243.000.
Norapp A/S: *See—*
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Noren, Oscar B.; and Kwarsick, Edmund J., to Parke, Davis & Company. Actuator apparatus. 4,001,755, Cl. 338-32.00H.
Norman, Richard E. Four-channel color organ. 4,000,679, Cl. 84-464.000.
Norris Industries, Inc.: *See—*
Weeks, Charles B.; and Choate, Paul V., 4,000,689.
North American Philips Corporation: *See—*
van Roessel, Frederik Johannes, 4,001,502.
Northern Electric Company Limited: *See—*
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Naylor, David Charles, 4,001,513.
Northern Telecom, Inc.: *See—*
Osborne, Deane C.; Harrison, John M.; and Hillman, Alfred K., Jr., 4,001,559.
Northrop Corporation: *See—*
Wong, Wilford F.; Hall, Gordon R.; Tsukahira, Tatsuo W.; and Sutton, Robert D., 4,000,869.
Novak, Frank A.; and Dolejs, Anthony H., to Ardac, Inc. Note storage apparatus. 4,000,892, Cl. 271-180.000.
Noyori, Ryoji; Hayakawa, Yoshihiro; Baba, Yutaka; and Makino, Shinji, to Sanwa Kagaku Kenkyusho Co. Ltd. Process for the preparation of tropane alkaloids. 4,001,249, Cl. 260-292.000.
NRG Nufuel Company: *See—*
Bingham, Larry A., 4,000,990.
Nudelman, Sol: *See—*
Mardix, Shmuel; McIlvaine, Paul M.; and Nudelman, Sol, 4,001,627.
Numatics, Incorporated: *See—*
Ruffley, Douglas W., 4,000,684.
N.V. Industrieele Handelscombinatie Holland: *See—*
Donkers, Jacobus M., 4,000,568.
Nyi, Kayson; and Graham, Sandra I., to Rohm and Haas Company. Acrylic acid esters. 4,001,304, Cl. 260-486.00R.
Nysted, Leonard N., to G. D. Searle & Co. 6-(Aminated methyl)-3β-oxy-5α-(cholestane-stigmastane)-5,6-diols, salts thereof, and intermediates thereto. 4,001,220, Cl. 260-239.55R.
Oba, Yoichi: *See—*
Saiki, Atsushi; Sato, Kikuji; Harada, Seiki; Tsunoda, Terue; and Oba, Yoichi, 4,001,870.
Ochiai, Kazuo: *See—*
Araseki, Takashi; and Ochiai, Kazuo, 4,001,505.
Oda, Minoru: *See—*
Arima, Sumitaro; Oda, Minoru; Miyashita, Kyoichi; and Takada, Mamoru, 4,001,589.
Odetics, Inc.: *See—*
Schulz, Gordon, 4,000,866.
Odle, Herbert Arnold: *See—*
Sullivan, Daryl Dean; and Odle, Herbert Arnold, 4,001,575.
Ogasawara, Takahisa; Senzaki, Yoshimichi; Kato, Hiroyuki; and Tatemichi, Hidemaro, to Toagosei Chemical Industry Co., Ltd. Process for the preparation of cured oligoacrylates. 4,001,097, Cl. 204-159.160.
Ogawa, Masaya: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.
Oger, Pierre: *See—*
Buchholtzer, Claude; Deman, Pierre; Drobecq, Michel; and Oger, Pierre, 4,001,511.
Ogino, Akira; Nakai, Yoshikazu; Nakayama, Takeo; and Miyamura, Koji, to Takeda Chemical Industries, Ltd. Unsaturated polyester resin composition. 4,001,153, Cl. 260-22.0CB.
Ogirima, Masahiko: *See—*
Kurata, Kazuhiro; Honma, Kozi; Ogirima, Masahiko; Ono, Yuichi; and Keikoin, Yoshiteru, 4,000,716.
Oguchi, Noboru; Hiramatsu, Takashi; Igami, Ikuo; Aoki, Akira; Tanaka, Shogo; Seki, Toshiro; and Inoue, Takao, to Mitsubishi Rayon Co., Ltd. Apparatus for manufacturing synthetic tow for stretch-cut spinning process. 4,000,960, Cl. 425-76.000.
Ogura, Katsuyuki: *See—*
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,001,276.
Ogura, Seiki: *See—*
Aoki, Takaaki; Evrenidis, Paul; Igarashi, Ryo; and Ogura, Seiki, 4,001,612.
Ohashi, Nobuo: *See—*
Nakazato, Yoshio; Nakazawa, Masatoshi; Ohashi, Nobuo; and Ito, Yo, 4,001,052.
Ohdan, Koji: *See—*
Juna, Kiyoshi; Ohdan, Koji; Nakayama, Hiroyuki; and Asada, Kiyohiko, 4,001,150.
Ohno, Shigeru; Sekigawa, Fujio; and Yamagishi, Shokichi, to Shin-Etsu Chemical Co., Ltd. Method of coating pharmaceutical solid dosage forms. 4,001,390, Cl. 424-35.000.
Oicles, Jeffrey A.: *See—*
Sorkin, Morris; and Oicles, Jeffrey A., 4,001,687.
Oiles Industry Co., Ltd.: *See—*
Sugafuji, Akira; Kurimoto, Hiroshi; and Takase, Tadaaki, 4,000,981.
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. Removing oxides of nitrogen from gaseous mixtures with alkali manganate solutions. 4,001,372, Cl. 423-235.000.

Okagami, Akio; Uemoto, Kunihiko; and Satoh, Kouichi, to Japan Gasoline Co., Ltd.; and Nikki Chemical Co., Ltd. Low-temperature steam reforming process for hydrocarbons. 4,000,987, Cl. 48-214.00A.

Okajima, Hidekazu; Takigawa, Tomoshi; Hirata, Noritsugu; Toyama, Masamichi; and Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Automatic exposure adjusting device. 4,000,941, Cl. 352-141.000.

Okamoto, Tomiyasu; Nishimoto, Tsunanori; Harada, Koji; and Murata, Seiichiro, to Hitachi Shipbuilding and Engineering Co., Ltd. Tank supporting structure for ships. 4,000,711, Cl. 114-74.00A.

Okayama, Masanori: *See—*
Aoki, Teruaki; Yamoto, Hisayoshi; Okayama, Masanori; Hirata, Yoshimi; Sato, Shuichi; and Yamada, Takaaki, 4,001,762.

Okazaki, Saburo: *See—*
Matsumura, Yasuo; Kishimoto, Soichiro; and Okazaki, Saburo, 4,001,382.

Okimoto, Kiyomi: *See—*
Masaki, Mitsuo; Matsunami, Satoshi; Fuzimura, Susumu; and Okimoto, Kiyomi, 4,001,240.

Okuwaki, Akitsugu: *See—*
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 4,001,372.

Olashaw, William F.; and Kaufhold, Frederick D., to General Electric Company. Apparatus for mechanically assisting the installation and removal of an electrical device with respect to a switchboard. 4,001,653, Cl. 317-119.000.

Olin Corporation: *See—*
Staba, Edward A., 4,001,060.

Olsen, Roy, to Superior Outdoor Display, Inc. Sequence reversing border light display. 4,001,810, Cl. 340-338.000.

Olson, Harry W., to Molex Incorporated. Alternate action switch. 4,004,526, Cl. 200-16.00D.

Olson, Jack R., to United States of America, Navy. High sensitivity flowmeter. 4,000,648, Cl. 73-189.000.

Olstowski, Franciszek, to Dow Chemical Company, The. Rapid setting polyurethanes from diols and polyfunctional isocyanates. 4,001,165, Cl. 260-33.6UB.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 4,001,166, Cl. 260-33.6UB.

Olympus Optical Co., Ltd.: *See—*
Maitani, Yoshihisa; and Hashimoto, Akihiko, 4,001,845.

O'Mara, James H.: *See—*
Specht, Edward H.; and O'Mara, James H., 4,000,986.

Omichi, Tokio, to Kabushiki Kaisha Bambi; and Kabushiki Kaisha Hattori. Device for adjusting the length of a watchband. 4,000,542, Cl. 24-71.00J.

Omino, Mamoru: *See—*
Miyazaki, Ken; Takahashi, Kazutoshi; and Omino, Mamoru, 4,001,785.

Onahama Seiren Kabushiki Kaisha: *See—*
Goto, Motoo; Fujiwara, Minoru; and Ishikawa, Makoto, 4,001,013.

Onder, Besir K., to Upjohn Company, The. Preparation of polyimide from organic diisocyanate with alkali metal salt of alcohol as catalyst. 4,001,186, Cl. 260-63.00N.

Ono, Shigeo: *See—*
Iwakura, Junji; Sato, Kimihiko; Fujii, Hisashi; Hashimoto, Yoshihiro; Ono, Shigeo; Watanabe, Shozaburo; and Yokoyama, Akio, 4,001,384.

Ono, Yuichi: *See—*
Kurata, Kazuhiro; Honma, Kozi; Ogirima, Masahiko; Ono, Yuichi; and Keikoin, Yoshiteru, 4,000,716.

Oppenheimer, Edgar D. Method and apparatus for testing tensile properties. 4,000,644, Cl. 73-95.000.

O'Pray, John E.; Channell, Ronald E.; and Roberto, Francisco Q., to United States of America, Air Force. Fluorine generating solid formulation for use in chemical lasers. 4,001,135, Cl. 252-187.00R.

O'Pray, John E.: *See—*
Channell, Ronald E.; O'Pray, John E.; and Roberto, Francisco Q., 4,001,136.

Opti Products Incorporated: *See—*
Kocmich, Donald Orrie, 4,000,640.

Ordnance Research, Inc.: *See—*
Griffin, Floyd S., 4,001,610.

Orelup, Richard B., to Morton-Norwich Products, Inc. Azo dyes having a high solubility in petroleum fuels. 4,000,985, Cl. 44-59.000.

Orillo, Stephen, Jr.: *See—*
Uyetake, Tadao; Higa, Teikichi; Orillo, Stephen, Jr.; and Nakano, Gregory, 4,000,584.

Orlando, Salvatore: *See—*
Jemison, William; Orlando, Salvatore; and Fink, Richard, 4,000,875.

Orloff, George, to Lucas Industries Limited. Fluid flow control valves. 4,000,755, Cl. 137-595.000.

Orlowski, Jan A.: *See—*
Lee, Henry L., Jr.; and Orlowski, Jan A., 4,001,483.

Osaka City: *See—*
Manabe, Osamu; and Nara, Kenichi, 4,001,313.

Osborn, Alfred: *See—*
Limeres, Ricardo; and Osborn, Alfred, 4,001,747.

Osborne, Deane C.; Harrison, John M.; and Hillman, Alfred K., Jr., to Northern Telecom, Inc. Programmable measuring. 4,001,559, Cl. 235-151.310.

Osborne, Thomas E.: *See—*
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; and Baum, Allen J., 4,001,569.

Osiko, Vyacheslav Vasilievich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983.

Osono, Takashi; Moriyama, Kiruko; Murakami, Keisuke; and Umezawa, Hamao, to Yamanouchi Pharmaceutical Co., Ltd. Process for the production of monopropionyl-josamycin-2. 4,001,399, Cl. 424-123.000.

Osterreichische Mineralolverwaltung Aktiengesellschaft: *See—*
Senolt, Hans; Tomaschko, Heinrich; and Palvik, Georg, 4,001,091.

Ostgaard, John T.; Doornbos, James M.; Bartley, John E.; and de Lange, Cor. Manned welding and inspection vehicle. 4,000,701, Cl. 104-138.00R.

Ota, Akira: *See—*
Miyoshi, Jun; Kajikawa, Yoji; Ota, Akira; Asaoka, Junichi; and Kino, Yoshio, 4,001,044.

Otaki, Yasuhiko: *See—*
Masuda, Keiji; Kizawa, Hidenori; and Otaki, Yasuhiko, 4,001,257.

Ottl, Adolf; Dost, Fredy; and Breindl, Otto, to Maschinenfabrik Augsburg-Nurnberg AG. Valve cage structure for internal combustion engines, particularly adapted for fluid cooling. 4,000,730, Cl. 123-189.000.

Otto, Josef: *See—*
Bauer, Hannsgeorg; and Otto, Josef, 4,001,009.

Overby, Albert W.; and Parks, Donald P., to International Business Machines Corporation. Digital audio output device. 4,000,565, Cl. 35-35.00A.

Owens-Corning Fiberglas Corporation: *See—*
Bell, Reuben H., 4,001,329.
McCormick, Ronald O., 4,001,542.

Owens-Illinois, Inc.: *See—*
Keyes, Melvin H., 4,001,085.

Oxbow Products, Inc.: *See—*
Kelley, O. W., 4,000,577.

Ozaki, Ryosuke: *See—*
Funatani, Kiyoshi; Ozaki, Ryosuke; and Mizuno, Kazuhiro, 4,000,628.

P. R. Mallory & Co., Inc.: *See—*
Deane, Kenneth E.; Ring, Thomas F.; and Malott, Bernard, 4,001,528.
Scott, Charles E., 4,001,535.
Voyles, Gerald A.; and Davies, William D., 4,001,655.
Voyles, Gerald A., 4,001,656.

Pace, Henri; Lavedrine, Marcel; and Berdou, Jean, to U.S. Philips Corporation. Incandescent lamp having a reflecting dome and spheroconical envelope. 4,001,621, Cl. 313-113.000.

Page, Robert Brian: *See—*
Howles, Donald Arthur; and Page, Robert Brian, 4,001,623.

Pagnoni, Franco, to Fratelli Pagnoni S.p.A. Method and apparatus for forming and pressing foil and board laminates. 4,001,074, Cl. 156-580.000.

Palen, Vernon B.: *See—*
Lucek, John R.; and Palen, Vernon B., 4,000,999.

Palmer, Robert G.: *See—*
Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., 4,001,848.

Palmieri, Joseph M.: *See—*
Klein, Keith W.; and Palmieri, Joseph M., 4,001,647.
Klein, Keith W.; and Palmieri, Joseph M., 4,001,652.

Palvik, Georg: *See—*
Senolt, Hans; Tomaschko, Heinrich; and Palvik, Georg, 4,001,091.

Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslav Petrovich; and Grinev, Mikhail Petrovich. Color indicator-dosimeter of ionizing radiation. 4,001,587, Cl. 250-474.000.

Panel Technology, Inc.: *See—*
Thayer, Stephen C., 4,001,629.

Panter, Hubert Gerald: *See—*
Lonseth, Palmer; Selkirk, Neil Robertson; and Panter, Hubert Gerald, 4,001,616.

Park Chemical Co.: *See—*
Justice, Timothy R.; and Foreman, Robert W., 4,001,038.

Parke, Davis & Company: *See—*
Noren, Oscar B.; and Kwarsick, Edmund J., 4,001,755.

Parker, Alan I.: *See—*
Nash, Dudley O.; Beavers, Robert G.; Burge, Joseph C.; Castells, Onofre T. M.; and Parker, Alan I., 4,000,610.

Parker, Stephen D.: *See—*
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Parks-Cramer Company: *See—*
Lee, Charles D., Jr., 4,000,603.

Parks, Donald P.: *See—*
Overby, Albert W.; and Parks, Donald P., 4,000,565.

Parks, Jack G.; and McInnes, Gordon J., to United States of America, Army. Peak value detector. 4,001,604, Cl. 307-235.00A.

Parks, Michael P.: *See—*
Anthone, Robert; and Parks, Michael P., 4,001,033.

Partyka, Richard Anthony; and Crenshaw, Ronnie Ray, to Bristol-Myers Company. Oxazole, isoxazole, thiazole and isothiazole amides. 4,001,237, Cl. 260-256.40B.

Partyka, Richard Anthony; and Crenshaw, Ronnie Ray, to Bristol-Myers Company. 1,3,4-Oxadiazole amides. 4,001,238, Cl. 260-256.40B.

Pascal, Yves Robert Alain: *See—*
Najer, Henry; and Pascal, Yves Robert Alain, 4,001,251.

Pascor, Michel, to Equipements de Machines-Outils Spemo. Chucks for machine tools, such as lathes and grinding machines. 4,000,907, Cl. 279-121.000.

Paskert, Joseph H., to Eaton Corporation. Monitor actuating device and reusable fastener therefor. 4,000,543, Cl. 24-150.00R.

Passerini, Norina; Ermili, Aldo; Roma, Giorgio; Balbi, Alessandro; and Mazzei, Mauro, to Carlo Erba S.p.A. 1-Oxo-1H-naphtho [2,1-b] pyran derivatives for treating depression. 4,001,424, Cl. 424-283.000.

Patel, Bhupendra C.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,000,741.

Patel, Girish: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, 4,001,151.

Patel, Jayantilal S., to Digital Systems, Inc. Automatic tool changing apparatus for drilling machines and the like. 4,000,954, Cl. 408-3.000.

Patel, Suman H.; and Jones, Thomas, to National Semiconductor Corporation. Integrated circuit relaxation oscillator. 4,001,722, Cl. 331-111.000.

Patheiger, Manfred: *See—*
Selbeck, Harald; Dhein, Rolf; Rudolph, Hans; Patheiger, Manfred; and Bendszus, Otto, 4,001,348.

Pathophysiologisches Institut der Universitat Bern: *See—*
Trechsel, Ulrich, 4,001,117.

Patron, Luigi; Mazzuco, Pier Luigi; Veneto, Favato; Trevisan, Enzo; and Niero, Ennio, to Montefibre S.p.A. Process for spinning acrylic polymers. 4,001,485, Cl. 526-341.000.

Patsch, Manfred: *See—*
Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, 4,001,335.

Patterson, Garvin W.: *See—*
Monahan, Earnest M.; Patterson, Garvin W.; and Calle, Jaime, 4,001,783.

Patterson, Garvin Wesley; and Porter, Marion G., to Honeywell Information Systems, Inc. Pathfinder microprogram control system. 4,001,788, Cl. 340-172.500.

Patton, Bobbie J.: *See—*
Sexton, James H.; Patton, Bobbie J.; and Harrell, John W., 4,001,775.

Patton, Jon R., to Clark Equipment Company. Apparatus for controlling the pressure of a fluid fed to a clutch. 4,000,795, Cl. 192-109.00F.

Paul, Maynard C.: *See—*
Lo, David S.; and Paul, Maynard C., 4,001,795.

Pauly, Lou Allen. Solar furnace. 4,000,733, Cl. 126-270.000.

Pearce, Robert James: *See—*
Galt, Ronald Hilson Begg; and Pearce, Robert James, 4,001,419.

Pearson, Anthony J. C.: *See—*
Hershman, Arnold; and Pearson, Anthony J. C., 4,001,213.

Pearson, Michael J.; Rigge, Ronald J.; and Carniglia, Stephen C., to Kaiser Aluminum & Chemical Corporation. Process for modifying the pore volume distribution of alumina base catalyst supports. 4,001,144, Cl. 252-463.000.

Pearson, Robert P., to Honeywell Inc. Apparatus for producing a compensating voltage. 4,000,643, Cl. 73-88.50R.

Pech, David J.: *See—*
Morrow, James G., Sr.; Pech, David J.; and Kutz, Norman J., 4,000,784.

Peck, Robert L.: *See—*
Hall, Kilmer L.; Davis, Allen E.; and Peck, Robert L., 4,001,554.

Pedersen, Jack Raymond; and Aanerud, Lars Arthur, to International Standard Electric Corporation. Submarine power cable grounding means and method. 4,001,489, Cl. 174-10.000.

Pedigree Petfoods Limited: *See—*
Horrocks, Derek; Buckley, Keith; and Vernon, Alan John, 4,001,445.

Peinado, Fernando Rabadan: *See—*
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,001,414.

Pendlebury, David: *See—*
Fisher, William Bernard; Helmer, Howard Lyle; and Pendlebury, David, 4,001,359.

Penneck, Richard John; and Clabburn, Robin James Thomas, to Raychem Corporation. Cross-linked olefine-ester tapes. 4,001,065, Cl. 156-86.000.

Penneck, Richard John, to Raychem Corporation. High voltage insulating materials. 4,001,128, Cl. 252-63.200.

Pennwalt Corporation: *See—*
Dave, Bhalchandra Anantray, 4,001,443.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 4,001,207.

Pentney, Harry, to Gillette Company, The. Dispensing containers. 4,000,832, Cl. 221-232.000.

Penton, Hugh V., to California Metal Enameling Company. Contrasting marker panel for highway guardrails and the like. 4,000,882, Cl. 256-13.100.

Pepsico, Inc.: *See—*
Butzen, Kenneth B., 4,000,894.

Performance Industries, Inc.: *See—*
Boyesen, Eyvind, 4,000,723.

Perkins, Sonnie Joseph. Golf putter with in-line aiming and directional control capabilities. 4,000,902, Cl. 273-164.000.

Perretta, Frank. Ink fountain blade assembly. 4,000,695, Cl. 101-365.000.

Perrey, Hermann: *See—*
Matner, Martin; Perrey, Hermann; and Schwinum, Ernst, 4,001,162.

Personick, Stewart David: *See—*
Cook, John Stone; and Personick, Stewart David, 4,001,578.

Petersen, Alfred W., to Stauffer Chemical Company. Impure sulfuric acid treatment process. 4,001,383, Cl. 423-531.000.

Petersen, Arne J., to Beckman Instruments, Inc. Sample residue cleaning system for biological analyzers. 4,000,973, Cl. 23-230.00R.

Peterson, Raymond J.: *See—*
Carol, John A., Jr.; and Peterson, Raymond J., 4,001,776.

Petigara, Ramesh B.: *See—*
Yale, Harry Louis; and Petigara, Ramesh B., 4,001,233.

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Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,001,432.

Petrochemicals Company, Inc.: *See—*
Jasnosz, John J., 4,001,378.

Petry, Robert C., to Rohm and Haas Company. Nitrogen- and fluorine-containing compounds. 4,001,059, Cl. 149-109.400.

Pettersson, Per August: *See—*
Wingbro, Torgny; Hjalmarsson, Jan; and Pettersson, Per August, 4,000,815.

Pfeiffer, Heinrich: *See—*
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Pfiffner, Albert: *See—*
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Pfizer Inc.: *See—*
Celmer, Walter D.; Moppett, Charles E.; Cullen, Walter P.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, 4,001,397.
Danilewicz, John C.; Evans, Anthony G.; Ham, Allan L.; and Thomson, Colin, 4,001,422.
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Phillips Fibers Corporation: *See—*
Michalski, Arnold, 4,001,538.

Phillips, Kenneth G., to Nalco Chemical Company. Latex coagulant for emulsion breakers. 4,001,486, Cl. 528-492.000.

Phillips, Paul S., Jr.: *See—*
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Phillips Petroleum Company: *See—*
Drake, Charles A.; and Marwil, Stanley J., 4,001,294.
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Pichel, Maurice Desire: *See—*
Geurtsen, Friedrich Henri Herman; and Pichel, Maurice Desire, 4,000,690.

Picker Corporation: *See—*
Mehrbrodt, Alfonso W.; Mog, Walter F.; and Brunnett, Carl J., 4,001,580.

Pickett, John E. P.: *See—*
Kinney, Thomas D.; and Pickett, John E. P., 4,001,460.

Pico Electronics Limited: *See—*
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Pielemeier, John William: *See—*
Schrage, Joy A.; Pielemeier, John William; and Czech, James I., 4,000,968.

Piktor Limited: *See—*
Goust, Jean Michel; and Moulias, Robert Louis, 4,001,080.

Pilkington Brothers Limited: *See—*
Maltman, William Ramsey; and Howard, Colin Robert, 4,001,476.

Pinckney Molded Plastics, Inc.: *See—*
Sanders, Ellsworth E.; and Kreeger, Elsmer W., 4,000,817.

Pisarski, Arthur J.; and Pisarski, Margaret. Caddy for cigarettes and the like. 4,000,812, Cl. 206-87.000.

Pisarski, Margaret: *See—*
Pisarski, Arthur J.; and Pisarski, Margaret, 4,000,812.

Pitney-Bowes, Inc.: *See—*
Calderazzo, Franklin J.; and Fassman, Arnold, 4,000,890.
Mol, Hans C.; Byrne, Leroy H.; and Fassman, Arnold, 4,000,889.

Pitre, David E.: *See—*
Felder, Ernst; and Pitre, David E., 4,001,323.

Pizer, Robert S.: *See—*
Haffner, Mark P.; and Pizer, Robert S., 4,000,564.

Plank, Charles J.; and Rosinski, Edward J., to Mobil Oil Corporation. Catalytic conversion of hydrocarbons. 4,001,106, Cl. 208-75.000.

Plasko, Emil Robert, to Emerson Electric Co. Temperature responsive electrical switch construction and method of making the same. 4,001,754, Cl. 337-407.000.

Platt, Stephen A.; and Wolff, Gerhard W., to Platt, Stephen A.; Platt, Vernet B.; Wolff, Gerhard Walter; and Wolff, Jeanine V. Manual tape apparatus with generator for providing electrical power. 4,001,887, Cl. 360-90.000.

Platt, Vernet B.: *See—*
Platt, Stephen A.; and Wolff, Gerhard W., 4,001,887.

Plattner, Jacob J.; Harbert, Charles A.; and Tretter, James R., to Pfizer Inc. 5-Aryl-1,2,3,4-tetrahydro-γ-carbolines. 4,001,263, Cl. 260-296.00A.

Pleis, Duane R., to Dakota Iron, Inc. Hydraulic hose skiving machine. 4,000,552, Cl. 29-76.00R.

Plessey Handel und Investments A.G.: *See—*
Martin, Barrie James, 4,000,852.
Tench, Michael Dennis Roy, 4,001,792.

Plessey Incorporated: *See—*
Fraioli, Anthony V., 4,001,586.

Plonka, James H.; and Davis, Ralph A., to Dow Chemical Company, The. Process for production of γ-halonitriles. 4,001,293, Cl. 260-465.700.

Plough, Inc.: *See—*
Feinstone, Wolffe Harry; and Bandelin, Fred J., 4,001,391.

Poehlmann, Paul W., to H. Koch & Sons, Inc. Gas-actuated emergency pilot release system. 4,000,917, Cl. 285-18.000.

Poittevin, Andre; and Hardy, Michel, to Roussel-UCLAF. 2-Hydroxymethyl-thiazole-5-carboxylic acid derivatives. 4,001,447, Cl. 424-270.000.

Poland, Robert LeRoy: *See—*
Braun, Walter Jacob; Altshuler, John Henry; Schlatter, Gerald Lance; and Poland, Robert LeRoy, 4,000,972.

Polaroid Corporation: *See—*
Biber, Conrad H., 4,001,639.
Biber, Conrad H., 4,001,640.
Borror, Alan L., 4,001,275.
Borror, Alan L., 4,001,278.
Ellin, Seymour, 4,001,843.
Karger, Eva R.; and MacGregor, Paul T., 4,001,277.
Sullivan, Charles I., 4,001,467.

Poly-Choke Company, Incorporated, The: *See—*
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Polymer Corporation, The: *See—*
Hussey, Eugene H., 4,001,124.

Polymer Sciences Corporation: *See—*
Kosower, Edward M.; and Kosower, Nechama S., 4,001,428.

Pommer, Ernst-Heinrich; Zeeh, Bernd; Goetz, Norbert; and Giergensohn, Bjoern, to BASF Aktiengesellschaft. Certain fungicidal pyridines. 4,001,416, Cl. 424-266.000.

Poncet, Alain; and Roccaz, Serge, to Merlin Gerin. Gastight liquid-type dynamic seal for control shafts of pressurized circuit interrupters. 4,000,930, Cl. 308-36.300.

Ponsar, Yves Marie. Apparatus for measuring the apparent weight of a sludge charging a liquid. 4,000,657, Cl. 73-448.000.

Poortman, Karel Arnold. Tee off device. 4,000,904, Cl. 273-183.00A.

Poot, Albert Lucien: *See—*
Vandenberghe, Antoon Leon; Heugebaert, Frans Clement; and Poot, Albert Lucien, 4,001,026.

Porawski, Donald J.: *See—*
Thomas, Francis J.; Kirchhein, Albert; and Porawski, Donald J., 4,001,605.

Porret, Daniel: *See—*
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 4,001,236.

Porter, David H.; and Bray, Douglas, to Thomas Industries, Inc. Suspension fixture. 4,001,574, Cl. 240-78.00E.

Porter, Marion G.: *See—*
Patterson, Garvin Wesley; and Porter, Marion G., 4,001,788.

Portugali, Iza. Free-piston rotary device particularly useful as hydraulic motor or pump. 4,000,959, Cl. 418-35.000.

Posnick, Irving H. Whirlpool tub and method of making same. 4,000,528, Cl. 4-180.000.

Postema, Leonard F. Tool and method for trueing wheel rims. 4,000,639, Cl. 72-316.000.

Postolaty, Vitaly Mikhailovich; Venikov, Valentin Andreevich; Astakhov, Jury Nikolaevich; Chaly, Georgy Vladimirovich; and Kalinin, Lev Pavlovich. Polyphase AC power transmission arrangement with homogeneous phases. 4,001,672, Cl. 323-124.000.

Potoski, John R.: *See—*
Freed, Meier E.; and Potoski, John R., 4,001,326.
Freed, Meier E.; and Potoski, John R., 4,001,331.

Powazinik, William: *See—*
Robinson, Lawrence B.; and Powazinik, William, 4,001,076.

Powell, David B.; and Acampora, Vincent P., to General Electric Company. Circuit breaker with bell alarm and breaker lockout accessory. 4,001,739, Cl. 335-34.000.

Powell, Lawson William: *See—*
Savidge, Thomas Adrian; and Powell, Lawson William, 4,001,264.

Powell, Ronald Lee: *See—*
Bail, John W.; Powell, Ronald Lee; and Smith, Frank Patterson, 2nd, 4,001,824.

Powell, Truman W.; and Davis, Jordan R., to Powell, Truman W. Coded signaling and control system. 4,001,772, Cl. 340-171.0PF.

Powers, John V.: *See—*
Ahn, Kie Y.; Hatzakis, Michael; and Powers, John V., 4,001,061.

Pozzi, Mario: *See—*
Testa, Giorgio; and Pozzi, Mario, 4,001,812.

PPG Industries, Inc.: *See—*
Bosso, Joseph F.; and Wismer, Marco, 4,001,101.
Bosso, Joseph F.; and Wismer, Marco, 4,001,156.
Cypher, James H., 4,000,593.
Gorton, Earl M.; and Kline, Robert W., 4,001,345.
Knavish, Leonard A.; and Cerutti, Richard L., 4,001,001.

Pradon, Jacques. Device for lowering bulk materials. 4,000,808, Cl. 198-572.000.

Pratt, Stanley L.: *See—*
Way, Allan S.; and Pratt, Stanley L., 4,000,946.

Prazak, Gerald: *See—*
Dilling, Peter; and Prazak, Gerald, 4,001,202.

Precision Instrument Co.: *See—*
Becker, Carl H.; Wong, Herman; and Kaspari, William J., 4,001,840.

Preuss, Arnfried, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Compensating bridge circuit. 4,001,669, Cl. 323-75.00C.

Price, William A., Jr., to Du Pont de Nemours, E. I., and Company. Methods of treating hypertension and pharmaceutical compositions comprising 1-tertiary-alkyl-3-(substituted furyl)ureas as antihypertensive agents. 4,001,425, Cl. 424-285.000.

Priem, Jan Jozef: *See—*
Van Paesschen, August Jean; Van Gossum, Lucien Janbaptist; and Priem, Jan Jozef, 4,001,023.

Pries, Erich, to Dr. C. Otto & Comp. G.m.b.H. Charging car for coke ovens. 4,001,092, Cl. 202-262.000.

Prins, Albertus; and Velo, Henri Jan, to U.S. Philips Corporation. Single-ended/push-pull converter. 4,001,706, Cl. 330-14.000.

Procter & Gamble Company, The: *See—*
Liepa, Alexander L., 4,001,441.
Maguire, Edward John, Jr., 4,001,132.
Montgomery, Ronald Earl, 4,001,131.

Proctor & Associates Company: *See—*
Proctor, Darryl F.; and Skelly, Peter T., 4,001,512.

Proctor, Darryl F.; and Skelly, Peter T., to Proctor & Associates Company. Automatic telephone number identification circuit. 4,001,512, Cl. 179-17.00A.

Proksch, Frederick D.: *See—*
Unruh, Dale H.; and Proksch, Frederick D., 4,000,910.

Proskurin, Leonid Leonidovich: *See—*
Chuchin, Alexandr Evgenievich; Proskurin, Leonid Leonidovich; Kalnova, Irina Jurievna; and Rozhkov, Vladimir Viktorovich, 4,001,173.

Prudhon, Lucien Pierre Emile; and Charil, Jean Pierre Georges, to Association des Ouvriers en Instruments de Precision. Apparatus for transmitting and receiving pulses. 4,001,524, Cl. 179-170.00T.

Pullman Incorporated: *See—*
Halliar, William R., 4,000,703.

Puritan-Bennett Corporation: *See—*
Romain, Jack, 4,001,650.

Puritz, Ernst; and Kraft, Erich, to Apparatebau Rothemuhle Brandt & Kritzler. Regenerative air preheater with automatically adjustable sealing device. 4,000,774, Cl. 165-4.000.

Pyrotenax of Canada Limited: *See—*
Howie, David Malcolm; McKenzie, Roy Victor W.; and Snape, James Ronald, 4,001,760.

QSI Systems, Inc.: *See—*
Folsom, David A., 4,001,881.

Quaintance, William J. Device for measuring and indicating reading speed. 4,001,561, Cl. 235-151.320.

Quaker Oats Company, The: *See—*
Brown, Lloyd H.; Eftax, Daniel S. P.; and Kopp, Joseph N., 4,000,770.
Hood, Larry Lee, 4,001,446.

Quarve, Vernon K.; and Vork, William, to Graco Inc. Fog/spray system and apparatus. 4,000,856, Cl. 239-332.000.

Quate, Calvin F.: *See—*
Albanese, Andres; and Quate, Calvin F., 4,001,577.

Quettier, Roger: *See—*
Castaing, Raimond; Blaise, Guy; and Quettier, Roger, 4,001,582.

R. A. Jones & Company, Inc.: *See—*
Adams, Charles W., 4,000,687.

R F L Industries, Inc.: *See—*
Kaufman, Barry M., 4,001,702.
Veleber, John R., 4,001,675.

Raabe, Johann A., to International Handling B.V. Reclaimer to reclaim blending beds, storage beds and the like. 4,000,822, Cl. 214-10.000.

Rabb, Teddy W. Mouth organ. 4,000,677, Cl. 84-375.000.

Rabe, Paul R.: *See—*
Hile, John W.; and Rabe, Paul R., 4,001,676.

Rabenhorst, David W., to Johns Hopkins University, The. Woven filament rotor structure. 4,000,665, Cl. 74-572.000.

Raber, J. Wayne, to Kaehr, Phillip, a part interest. Process for disposing of animal carcasses. 4,000,705, Cl. 110-3.000.

Radichel, Frank; and Wirkkanen, Richard, to Storage Technology Corporation. Digital circuit failure detector. 4,001,818, Cl. 340-415.000.

Radichel, Frank A., to Storage Technology Corporation. Electronic circuit testing apparatus. 4,001,686, Cl. 324-158.00R.

Raether, Wolfgang: *See—*
Winkelmann, Erhardt; and Raether, Wolfgang, 4,001,415.

Ramberg, Harold C.; and Legate, Alvin C., to United States of America, Interior. Method and apparatus for a power circuit breaker controller. 4,001,643, Cl. 317-11.00E.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Hindered piperidine carboxamide acids, metal salts thereof, and stabilized compositions. 4,001,181, Cl. 260-45.75N.

Rangabe, Alexander R. Pick-up cartridges for gramophone records. 4,001,519, Cl. 179-100.41G.

Rank Xerox Ltd.: *See—*
Howell, Michael L., 4,001,622.

Ravenscroft, Philip H.: *See—*
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,001,367.

Raychem Corporation: *See—*
Penneck, Richard John; and Clabburn, Robin James Thomas, 4,001,065.
Penneck, Richard John, 4,001,128.
Raymond Lee Organization, Inc., The: *See—*
Bailey, David E., 4,001,759.
Raytheon Company: *See—*
Birch, James D.; Mohr, Max C.; and Waterman, Raymond C., Jr., 4,001,730.
Kits van Heyningen, Arent H., 4,001,763.
RCA Corporation: *See—*
Carbonetta, Reno Raymond, Jr., 4,001,720.
Clemens, Jon Kaufmann; Fuhrer, Jack Selig; and Ross, Michael David, 4,001,496.
Dietz, Wolfgang Friedrich Wilhelm, 4,001,607.
Endriz, John Guiry; and Catanese, Carmen Anthony, 4,001,619.
Endriz, John Guiry, 4,001,620.
Hills, Vernon Elton; and Wu, Leesui, 4,001,613.
Kaseman, Paul Warren, 4,001,618.
Khajezadeh, Heshmat, 4,001,872.
Mack, Alfred; and Schweitzer, Cameron Charles, 4,001,690.
Schiess, Jorg; and Bart, Theodor Ernst, 4,001,876.
Sheng, Abel Ching Nam; and Malchow, Max Edward, 4,001,723.
Simpson, Theodore Frederick, 4,001,877.
Sterzer, Fred, 4,001,822.
Wang, Chih Chun; Lausman, Thomas Clifford; and Bates, Ronald Frank, 4,001,099.
Weimer, Paul Kessler, 4,001,501.
Weimer, Paul Kessler, 4,001,878.
Zuk, Borys, 4,001,608.
Re, Luciano; and Caciagli, Valerio, to Snam Progetti S.p.A. Process for the preparation of dioldiones. 4,001,333, Cl. 260-586.00P.
Reardanz, Eugene H.; and Boudreau, Jerry N., to General Foods Corporation. Intermediate moisture animal food having identifiable meat and egg components. 4,001,449, Cl. 426-332.000.
Reboul, Jean Philippe: *See—*
d'Auria, Luigi; Huignard, Jean-Pierre; Reboul, Jean Philippe; and Le Carvennec, Francois, 4,001,635.
Recker, Klaus: *See—*
Groegler, Gerhard; Dankert, Gerhard; Recker, Klaus; and Backes, Josef, 4,001,232.
Rector, Douglas L.: *See—*
Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., 4,001,256.
Redfern, Calvin E., to Allis-Chalmers Corporation. Ice breaking device for disconnect switch contact assemblies. 4,001,530, Cl. 200-48.00A.
Reed, Francis K., to Motorola, Inc. Search and confirm frequency synthesizer. 4,001,714, Cl. 331-4.000.
Reed, Francis Keith, to Motorola, Inc. Digital modulator and demodulator system for FDM telephony. 4,001,510, Cl. 179-15.0FD.
Reed, Samuel F., Jr., to Rohm and Haas Company. Combustible monomers and polymers therefrom. 4,001,191, Cl. 260-77.5BB.
Reese, Theodore J.: *See—*
McCord, Andrew T.; Wagner, Louis E.; and Reese, Theodore J., 4,001,031.
Regan, Robert: *See—*
McNeill, William; Lech, Joseph; Haugsjaa, Paul; and Regan, Robert, 4,001,631.
Regan, Robert James: *See—*
Haugsjaa, Paul Osborne; and Regan, Robert James, 4,001,632.
Regenos, Kenneth M.; and Barbano, Normand, to United States of America, Army. Dual scan corner reflector antenna. 4,001,837, Cl. 343-815.000.
Reiger, Arthur C., Jr., to Globe Tool and Engineering Company, The. Stator lead termination apparatus. 4,000,764, Cl. 140-113.000.
Reisman, Elias, to Aeronutronic Ford Corporation. Multiple wavelength transmissometer. 4,001,595, Cl. 250-575.000.
Reith, James E.: *See—*
Booth, William M.; and Rieth, James E., 4,000,653.
Rejnarowycz, Anya: *See—*
Murolo, Giuseppe, 4,001,458.
Reker, Frederick A., to General Signal Corporation. Ferrule for liquid tight flexible metal conduit. 4,000,918, Cl. 285-93.000.
Reliance Electric Company: *See—*
Chung, Jackson, 4,000,793.
Remeika, Joseph Peter; and Voorhoeve, Rudolf Johannes H., to Bell Telephone Laboratories, Incorporated. Catalytic process. 4,001,371, Cl. 423-213.200.
Rennick, John L.: *See—*
Adler, Robert; and Rennick, John L., 4,001,494.
Renold, Adolph, to Colgate-Palmolive Company. Fabric softener compositions containing N-alkyl-1,3-propylene diamine treated with maleic anhydride. 4,001,123, Cl. 252-8.800.
Reserve Synthetic Fuels, Inc.: *See—*
Bingham, Larry A., 4,000,990.
Reske, Eckart; Brinkmann, Ludwig; Fischer, Hartmut; and Rohrscheid, Freimund, to Hoechst Aktiengesellschaft. Transparent polyamides from bis(aminomethyl)-norbornanes. 4,001,192, Cl. 260-78.00R.
Rexnord Inc.: *See—*
Morris, John M., 4,000,995.
Reynolds Metals Company: *See—*
Scott, Irvin C., Jr.; and Swenck, George F., 4,000,895.
Rhone-Poulenc: *See—*
Bakassian, Georges; and Gay, Michel, 4,001,178.
Rhone-Poulenc S.A.: *See—*
Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, 4,001,271.
Richards, Gary H. Automatic pet feed dispenser. 4,000,719, Cl. 119-51.130.
Richardson Company, The: *See—*
Song, Il H., 4,001,484.
Richman, Jack E., to Du Pont de Nemours, E. I., and Company. Macrocyclic polyamines. 4,001,212, Cl. 260-239.0BC.
Richter, Peter: *See—*
Barzynski, Helmut; and Richter, Peter, 4,001,015.
Richter, Sidney B.; and Kyker, Glendon D., to Velsicol Chemical Corporation. Bis-(tetrahalophthalimidocarbonyl)-benzene. 4,001,179, Cl. 260-45.75B.
Rieth, James E.: *See—*
Booth, William M.; and Rieth, James E., 4,000,653.
Rieth, Paul H.: *See—*
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Rigassi, Norbert: *See—*
Chednekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,001,339.
Rigge, Ronald J.: *See—*
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Riha, Frank J., III: *See—*
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Riker Laboratories, Inc.: *See—*
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Rinehart, Dixie L., to Comfort Products, Inc. Articulated glove construction. 4,000,524, Cl. 2-161.00R.
Ring, Thomas F.: *See—*
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Ringel, Samuel M.: *See—*
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Riordan, Mathew B.: *See—*
Brumley, Ralph E.; Riordan, Mathew B.; and Bentley, Richard H., 4,000,549.
Risk, Daniel W., to Maxton Manufacturing Company. Automatic control valve for a fluid system. 4,000,754, Cl. 137-487.000.
Ritchey, Eugene B. Ear tag applying tool. 4,000,744, Cl. 128-330.000.
Rittler, Hermann L., to Corning Glass Works. Spontaneously-formed nepheline-carnegieite glass-ceramics. 4,000,998, Cl. 65-33.000.
Rober, Hans: *See—*
Vowinkel, Hans; and Rober, Hans, 4,000,642.
Robert H. Peterson Company: *See—*
White, William S., 4,000,732.
Roberto, Francisco Q.: *See—*
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O'Pray, John E.; Channell, Ronald E.; and Roberto, Francisco Q., 4,001,135.
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Tyler, Hugh J., 4,000,663.
Wagner, Joseph P.; and Steele, Everett T., Jr., 4,000,849.
Robinson, Glenn Nelson; and Jurisch, Louis A., to IMC Chemical Group, Inc. Process for sealing glass to metal. 4,001,068, Cl. 156-315.000.
Robinson, Lawrence B.; and Powazinik, William, to GTE Laboratories Incorporated. Method for growing thin epitaxial layers of a non-linear, optically active material. 4,001,076, Cl. 156-624.000.
Robinson, Roland L., to Rockwell International Corporation. Self-contained sensor. 4,001,798, Cl. 340-191.000.
Robinson, William M., to Cornell-Dubilier Electric Corporation. Capacitors having integral discharging means. 4,001,657, Cl. 317-256.000.
Roccaz, Serge: *See—*
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Rocco, Frank Louis: *See—*
Marmo, Don; and Rocco, Frank Louis, 4,001,438.
Roch, Jacques Leon, to Electroglas, Inc. Micro-circuit test probe. 4,001,685, Cl. 324-158.00P.
Rochat, Alain Claude: *See—*
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Rochester Instrument Systems, Inc.: *See—*
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Rockwell International Corporation: *See—*
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Swanson, Ronald L.; and Strathman, Lyle R., 4,001,716.
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Rode, France: *See—*
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; and Baum, Allen J., 4,001,569.
Rodger, Alexander J., to Slattery Manufacturing (Proprietary) Ltd. Feed mechanism for peanut combine. 4,000,747, Cl. 130-30.00C.
Rodionova, Galina Alexeevna: *See—*
Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich; Khlyntsev, Alexandr Sergeevich; Barsova, Antonina Petrovna; and Rodionova, Galina Alexeevna, 4,000,636.

Rody, Jean; and Rochat, Alain Claude, to Ciba-Geigy Corporation. Process for the manufacture of 2-(2-hydroxyphenyl)benztriazoles. 4,001,266, Cl. 260-308.00B.

Roelevink, Bauke Jacob, to U.S. Philips Corporation. Method of manufacturing a percussion flashlamp. 4,001,000, Cl. 65-59.00A.

Roemer, Sidney: *See—*
Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximilian, 4,001,398.

Rogers, Melvin F., to Zenith Radio Corporation. Method for reducing thermally induced fracture in cathode ray tube bulbs. 4,000,997, Cl. 65-23.000.

Rogers, Thelmer A. Cryogenic transport. 4,000,826, Cl. 220-3.000.

Rohm and Haas Company: *See—*
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Petry, Robert C., 4,001,059.
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Rohr, Wolfgang: *See—*
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Roma, Giorgio: *See—*
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Romain, Jack, to Puritan-Bennett Corporation. Method and apparatus for ultrasonic transducer protection. 4,001,650, Cl. 317-41.000.

Rooks, Wendell H., II, to Syntex (U.S.A.) Inc. Reduction of serum lipid levels and agents and compositions useful therefor. 4,001,407, Cl. 424-238.000.

Rosa, John: *See—*
Gyugyi, Laszlo; Rosa, John; and Stacey, Eric J., 4,001,670.

Rosch, Gunter: *See—*
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Rosen, Perry: *See—*
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Rosenbaum, Erik; and Klimchak, Edward G., to United States of America, Navy. Multiple hyperplane recognizer. 4,001,820, Cl. 343-5.0SA.

Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, to AGFA-Gevaert, A.G. Polymers which can be cross-linked by photopolymerization. 4,001,016, Cl. 96-35.100.

Rosenthal Technik AG: *See—*
Bauer, Ewald, 4,001,491.

Rosenwald, Gary W., to Cities Service Company. Storm choke. 4,000,780, Cl. 166-72.000.

Rosinski, Edward J.: *See—*
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Ross, Edward T. Flasher lamp/protective container assembly. 4,001,778, Cl. 340-114.00B.

Ross, Michael David: *See—*
Clemens, Jon Kaufmann; Fuhrer, Jack Selig; and Ross, Michael David, 4,001,496.

Rossi, Silvano, to Roussel-UCLAF. Substituted heterocyclic compounds, processes and composition including those. 4,001,408, Cl. 424-244.000.

Rossnick, Melvin, to Lepel High Frequency Laboratories, Inc. High power R.F. induction heating generator. 4,001,725, Cl. 331-117.00R.

Rosso, John B.; and Garrett, Sheyrl Wayne, to Combustion Engineering, Inc. Circuit for combining pulse trains. 4,001,701, Cl. 328-158.000.

Rote, Franklin E.; and Stephan, Raymond C., to United States Steel Corporation. Method of producing stainless steel. 4,001,012, Cl. 75-51.000.

Rotermund, Gerhard: *See—*
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Rotheim, Philip: *See—*
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Rounds, Hugh G.: *See—*
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Roura, Miguel Jacinto, to Du Pont de Nemours, E. I., and Company. Process for preparing tetrafluoroethylene-hexafluoropropylene copolymer blends. 4,001,351, Cl. 260-900.000.

Roussel-UCLAF: *See—*
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Routien, John B.: *See—*
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Rudolph, Karl-Heinz: *See—*
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Rudzinski, Stanley P. Method and apparatus for screening and comminuting device. 4,000,858, Cl. 241-27.000.

Ruffley, Douglas W., to Numatics, Incorporated. Safety lock-out valve. 4,000,684, Cl. 91-447.000.

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Ruhland, John G., to Xerox Corporation. Contact fuser and release agent applicator therefor. 4,000,957, Cl. 427-22.000.

Rumball, Kenneth Francis, to Airfix Industries Limited. Thermoplastic seam between juxtaposed edges of blank material. 4,001,471, Cl. 428-60.000.

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Ryan, Frederick M., to Westinghouse Electric Corporation. Low-pressure fluorescent discharge device which utilizes both inorganic and organic phosphors. 4,001,628, Cl. 313-487.000.

Rylatt, John A., to United States of America, Energy Research and Development Administration. Thermal baffle for fast-breeder reacton. 4,001,079, Cl. 176-87.000.

Ryu, Syoji: *See—*
Sugimoto, Michio; Yamamoto, Fumitada; Honna, Kosaku; Kurisaki, Konomu; Sugahara, Hirozo; Watanabe, Kiyoshi; Fujimoto, Yasuo; and Ryu, Syoji, 4,001,223.

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Sahm, Wilfried: *See—*
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Sahyun, Melville R. V., to Minnesota Mining and Manufacturing Company. Photographic materials comprising developer layers and binders comprising silica sol. 4,001,022, Cl. 96-76.00R.

Saijo, Takatoshi: *See—*
Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, 4,001,062.

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Lucas, Roland T., 4,000,916.

St. Petery, Richard A., Jr. Fruit harvesting machine. 4,000,601, Cl. 56-328.00R.

Saipem S.p.A.: *See—*
Bove, Ottavio; Grossi, Galeazzo; and Kirkley, David William, 4,001,543.

Sakai, Masao; Fukuoka, Masaru; and Hayashi, Katsuyoshi, to NGK Spark Plug Co., Ltd. Glassy resistor composition for use in a resistor incorporated spark plug. 4,001,145, Cl. 252-513.000.

Sakamoto, Elichi: *See—*
Nakajima, Tomio; Habu, Teiji; Sakamoto, Elichi; Yamada, Hiroshi; Mitsui, Katsuhide; and Hayashi, Eisaku, 4,001,021.

Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; and Honma, Isao, to Hitachi, Ltd. Capsule hydraulic-transportation system. 4,000,927, Cl. 302-2.00R.

Sakunaga, Kenichi: *See—*
Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Sakunaga, Kenichi; and Umemura, Eiji, 4,000,605.

Sala Magnetics, Inc.: *See—*
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Salmond, William G., to Upjohn Company, The. Process for preparing 25-hydroxycholecalciferol intermediates. 4,001,096, Cl. 204-158.00R.

Salomon, Georges Pierre Joseph, to S.A. Etablissements Francois Salomon & Fils. Ski boot. 4,000,567, Cl. 36-117.000.

Salzer, Erwin, to Chase-Shawmut Company, The. Electric fuse having helically wound fusible element and process for manufacturing the fuse. 4,001,748, Cl. 337-159.000.

Sanda, Shougo: *See—*
Noguchi, Masaaki; and Sanda, Shougo, 4,000,731.

Sander, Bruno; Bonitz, Eckhard; Berbner, Heinz; and Hoffmann, Manfred, to BASF Aktiengesellschaft. Production of non-foaming aqueous suspensions of polyethylene or polypropylene fibrids. 4,001,157, Cl. 260-29.4UA.

Sanders, Ellsworth E.; and Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Three level stacking container. 4,000,817, Cl. 206-505.000.

Sanders, Frederick W., to Mead Corporation, The. Sulfur recovery system. 4,001,385, Cl. 423-573.00G.

Sandford, Wayne H., Jr.; and Bates, Albert M., to United States of America, Navy. High accuracy sweep oscillator system. 4,001,726, Cl. 331-178.000.

Sandoz Ltd.: *See—*
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Sangster, Frederik Leonard Johan, to U.S. Philips Corporation. Charge transfer device. 4,001,862, Cl. 357-24.000.

Sanwa Kagaku Kenkyusho Co. Ltd.: *See—*
Noyori, Ryoji; Hayakawa, Yoshihiro; Baba, Yutaka; and Makino, Shinji, 4,001,249.

Sarkar, Nitis, to Dow Chemical Company, The. Pharmaceutical capsules from improved thermogelling methyl cellulose ethers. 4,001,211, Cl. 536-84.000.

Sasajima, Kikuo: *See—*
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Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, to Nippon Steel Corporation. Material for sintering emitting a lesser amount of nitrogen oxide and a method for manufacturing the same. 4,001,007, Cl. 75-5.000.

Sato, Akira: *See—*
Hayashi, Jun; Sato, Akira; and Shishido, Tadao, 4,001,020.

Sato, Eiichi: *See—*
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Sato, Hiromi: *See—*
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Sato, Kikuji: *See—*
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Sato, Shuichi: *See—*
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Sato, Tomi; and Iida, Yoshio, to Matsushita Electric Industrial Co., Ltd. Method for detecting a reducing material in a gas phase. 4,001,757, Cl. 338-34.000.

Sato, Yoshinari: *See—*
Umio, Suminori; Ueda, Ikuo; Matsuo, Masaaki; Kobayashi, Masakazu; Nakaguti, Osamu; and Sato, Yoshinari, 4,001,280.

Sato, Yoshinori: *See—*
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Satoh, Kouichi: *See—*
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Sattlegger, Hans: *See—*
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Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, to Warner-Lambert Company. Method for producing diuresis in a mammal by use of thiazolidinone acetic acid derivatives. 4,001,417, Cl. 424-267.000.

Sauer, Gerhard: *See—*
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 4,001,302.

Saul, Glenn; and Bur, Philip W., to Honeywell Inc. Transmission line interface circuit. 4,001,703, Cl. 330-1.00A.

Savac AG: *See—*
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Savidge, Thomas Adrian; and Powell, Lawson William, to Beecham Group Limited. Enzyme complexes and their use. 4,001,264, Cl. 260-306.70C.

Scaggs, Anthony L., to Dow Chemical Company, The. Novel fire-retardant polymer. 4,001,149, Cl. 260-2.5FP.

Schaefer, Dieter; and Motz, Herbert, to BASF Aktiengesellschaft. Process and apparatus for the manufacture of rigid magnetic discs. 4,001,463, Cl. 427-48.000.

Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, to BASF Aktiengesellschaft. Production of 3-monochloro-2,4,5-trialkylbenzophenones and 3,6-dichloro-2,4,5-trialkylbenzophenones. 4,001,335, Cl. 260-591.000.

Schat, Bralt Renze; and Timmermans, Abraham, to U.S. Philips Corporation. High-pressure discharge lamp having a metal lead through conductor. 4,001,625, Cl. 313-220.000.

Schatz, Vernon L. Universal funds transfer and identification card. 4,001,550, Cl. 235-61.70B.

Schefczik, Ernst: *See—*
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Scheinecker, Alois; and Biricz, Stefan, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Tundish car and rotary support for positioning tundish. 4,000,840, Cl. 222-607.000.

Scherer, Henry W.; and Swanson, Roy T., to S & C Electric Company. Corrosion resistant means in exhaust control device for circuit interrupting devices. 4,001,750, Cl. 337-280.000.

Schering Aktiengesellschaft: *See—*
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Schering Corporation: *See—*
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Scheuchzer, Fredy; Buhler, Fritz; and Chiesa, Alfred, to Les Fils d'Auguste Scheuchzer S.A. Apparatus for replacement of rail tracks. 4,000,699, Cl. 104-2.000.

Schexnayder, Lawrence F., to Caterpillar Tractor Co. Hydraulic load lifting system. 4,000,683, Cl. 91-411.00R.

Schick Incorporated: *See—*
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Schiess, Jorg; and Bart, Theodor Ernst, to RCA Corporation. Color correction circuit for video recorders. 4,001,876, Cl. 358-8.000.

Schiff, Maurice Leon, to International Telephone and Telegraph Corporation. Digital error correcting decoder. 4,001,779, Cl. 340-146.1AV.

Schiller, Arthur Maurice: *See—*
Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, 4,001,161.

Schinzel, Erich; Sahm, Wilfried; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Optical brighteners. 4,001,130, Cl. 252-89.00B.

Schinzel, Erich: *See—*
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Schloemann-Siemag Aktiengesellschaft: *See—*
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Schlunke, Hans-Peter: *See—*
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Schmid, Peter-Jens; and Lattmanig, Viktor, to Schmid, Peter-Jens. Arrangement permitting of a storage and removal of profiled members. 4,000,818, Cl. 214-1.00P.

Schmid, Wolfgang; Gutzwiller, Ernst; and Meyer, Urs, to Ciba-Geigy Corporation. Isothiocyanopyridine derivatives. 4,001,254, Cl. 260-294.80E.

Schmidt, Donald L., to Dow Chemical Company, The. Primer adhesive composition. 4,001,154, Cl. 260-29.4UA.

Schmidt, Gunter; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Penicillins. 4,001,218, Cl. 260-239.100.

Schmidt, Thomas R., to Shell Oil Company. Method and apparatus for measuring displacement of fixed structures. 4,000,658, Cl. 73-490.000.

Schneider, Guenter E., to Digital Equipment Corporation. Moving carriage for disk head positioner. 4,001,889, Cl. 360-104.000.

Schneider, Harold N., to General Electric Company. Method of testing the voltage withstand ability of a high voltage d-c cable at a voltage higher than its normal operating voltage while carrying current. 4,001,674, Cl. 324-54.000.

Schneider, Wolfger, to United States of America, Navy. Digital method of pulse width modulation. 4,001,728, Cl. 332-1.000.

Schoefberger, Georg, to Sandoz Ltd. Optionally substituted benzothiazolylphenyl-azo-alkanoylacetamidonaphthalenes. 4,001,206, Cl. 260-158.000.

Schoenrock, Karlheinz W. R.; and Rounds, Hugh G., to Amalgamated Sugar Company, The. Ion exchange method. 4,001,113, Cl. 210-33.000.

Schofield, Zeb Douglas, III: *See—*
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Schrage, Joy A.; Pielemeier, John William; and Czech, James I., to Whirlpool Corporation. Permanent press cycle for automatic washer. 4,000,968, Cl. 8-158.000.

Schreier, Wilford Rayburn, to Hammond Corporation. One key chording system for an electronic keyboard instrument. 4,000,674, Cl. 84-1.010.
Schroder, Peter, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Ink fountain in an inking system for printing presses. 4,000,694, Cl. 101-365.000.
Schueller, Pierre: *See*—
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Schulz, Gordon, to Odetics, Inc. Tape reel drive system for video recorder/reproducer. 4,000,866, Cl. 242-203.000.
Schulze-Berge, Klaus, to Langbein-Pfanhauser Werke AG. Process and bath for the metallization of synthetic-resin. 4,001,470, Cl. 427-304.000.
Schumacher, Otto; and Jonas, Hans, to Sigri Elektrographit GmbH. System for supplying current to a group of high-current resistance furnaces through a plurality of transformers. 4,001,487, Cl. 13-24.000.
Schuster, Stanley Everett, to International Business Machines Corporation. Two bit partitioning circuit for a dynamic, programmed logic array. 4,001,601, Cl. 307-205.000.
Schwab, Peter A., to Continental Oil Company. Preparation of vinyl halide-containing polymers. 4,001,482, Cl. 526-73.000.
Schwan, Thomas J., to Morton-Norwich Products, Inc. 2-[2-(Piperidino)ethyl]-10,10a-dihydro-1H,5H-imidazo[1,5-b]isoquinolin-1,3(2H)-dione. 4,001,245, Cl. 260-287.0CF.
Schwan, Thomas J., to Morton-Norwich Products, Inc. 3-Amino-5,6-dimethoxyindazole hydrochloride. 4,001,269, Cl. 260-310.00C.
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Scott, Charles E., to P. R. Mallory & Co., Inc. Multi-station push button for gas switches. 4,001,535, Cl. 200-340.000.
Scott, Irvin C., Jr.; and Swenck, George F., to Reynolds Metals Company. Ball bat. 4,000,895, Cl. 273-72.00A.
Scott, James E., to United States of America, Federal Communications Commission. Cavity tuning assembly having coarse and fine tuning means. 4,001,737, Cl. 333-83.00R.
Scott Paper Company: *See*—
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Scott, Steven William, to General Electric Company. Process for preparing a branched polycarbonate. 4,001,184, Cl. 260-47.0XA.
Scozzie, James A.: *See*—
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Selbeck, Harald; Dhein, Rolf; Rudolph, Hans; Patheiger, Manfred; and Bendszus, Otto, to Bayer Aktiengesellschaft. Unsaturated polyester resins containing additional accelerators. 4,001,348, Cl. 260-864.000.
Selcukoglu, Yuksel Ali, to Chicago Bridge & Iron Company. Gravitational separation of solids from liquefied natural gas. 4,001,116, Cl. 210-83.000.
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Senolt, Hans; Tomaschko, Heinrich; and Palvik, Georg, to Osterreichische Mineralolverwaltung Aktiengesellschaft. Asphalt blowing vessel. 4,001,091, Cl. 196-46.000.
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Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, to Merck Patent Gesellschaft mit beschrankter Haftung. 2-Acyl-4-oxo-pyrazino-isoquinoline derivatives and process for the preparation thereof. 4,001,411, Cl. 424-250.000.
Seufer, Theo, to Audi NSU Auto Union Aktiengesellschaft. Lubricant proportioning pump. 4,000,790, Cl. 184-27.00R.
Sevastakis, Gus. Die assembly for continuous vertical casting of tubular metallic products. 4,000,773, Cl. 164-281.00R.
Severini, Febo; Tavazzani, Carlo; and Delle Ville, Piero, to Montedison Fibre S.p.A. Impact resistant polystyrene and a process for its production. 4,001,349, Cl. 260-878.00R.
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Shah, Chandrakant Shantilal, to Du Pont de Nemours, E. I., and Company. Process for cospinning trilobal filaments. 4,001,369, Cl. 264-177.00F.
Shank, Joseph L., to Swift & Company. Encapsulation process utilizing microorganisms and products produced thereby. 4,001,480, Cl. 428-411.000.
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Shell, John W., to Alza Corporation. Ophthalmological bioerodible drug dispensing formulation. 4,001,388, Cl. 424-14.000.
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Shiomi, Yoshinori: *See—*
Ito, Tadahiko; Shiomi, Yoshinori; and Iwasa, Seizo, 4,000,666.
Shipman, Vern D., to Headway Research, Inc. Apparatus for spinning a microelectronic substrate. 4,001,659, Cl. 318-119.000.
Shirey, Robert D.: *See—*
Boggs, Alben C.; and Shirey, Robert D., 4,001,547.
Shirhall, Milan J. Practice mat for golfers. 4,000,905, Cl. 273-187.00A.
Shishido, Tadao: *See—*
Hayashi, Jun; Sato, Akira; and Shishido, Tadao, 4,001,020.
Shoemaker, Arthur H., to American Optical Corporation. Drawing attachment having a focusing system, power changer system and a telescope for a microscope. 4,000,935, Cl. 350-41.000.
Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich; Khlyntsev, Alexandr Sergeevich; Barsova, Antonina Petrovna; and Rodionova, Galina Alexeevna. Pipe bending machine. 4,000,636, Cl. 72-173.000.
Shuey, David R.: *See—*
Lavery, Lawrence P.; and Shuey, David R., 4,001,500.
Sickert, Klaus, to U.S. Philips Corporation. CMOS power-on reset circuit. 4,001,609, Cl. 307-268.000.
Siegel, Karl-Heinz, to Minigrip, Inc. Handle package. 4,000,768, Cl. 150-3.000.
Siemens Aktiengesellschaft: *See—*
Bonk, Franz; and Burger, Wolfgang, 4,001,507.
Falckenberg, Richard, 4,000,977.
Graul, Juergen; and Murrmann, Helmuth, 4,001,465.
Gross, Franz, 4,001,630.
Kiemle, Horst, 4,001,791.
Kleinschmidt, Peter, 4,001,677.
Kraus, Helmut, 4,001,839.
Voss, Peter, 4,001,865.
Weiss, Herbert; Maurer, Otto; and Kolbow, Peter, 4,001,046.
Siemens-Albis Aktiengesellschaft: *See—*
Weisigk, Gunther; Schmah, Karlheinz; and Berger, Harald, 4,001,516.
Signetics Corporation: *See—*
Cauge, Thomas P.; and Kocsis, Joseph, 4,001,860.
Meiling, Gerald S.; and Cauge, Thomas P., 4,001,048.
Signode Corporation: *See—*
Nix, Robert J., 4,001,064.
Sigri Elektrographit GmbH: *See—*
Schumacher, Otto; and Jonas, Hans, 4,001,487.
Silantiev, Viktor Sergeevich: *See—*
Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich; Khlyntsev, Alexandr Sergeevich; Barsova, Antonina Petrovna; and Rodionova, Galina Alexeevna, 4,000,636.
Silva, Melba F.: *See—*
McNeill, Charles T.; and Silva, Melba F., 4,001,358.
Simes, James G.: *See—*
Cook, Albert M.; Engleman, Frank A., Jr.; and Simes, James G., 4,001,700.
Simic, Dragomir; Zupancic, Heinz-Ulrich; and Cherubim, Martin, to Deutsche Texaco Aktiengesellschaft. Process for the production of flame-resistant phenolic resin foam plastics. 4,001,148, Cl. 260-2.50F.
Simkin, Joseph, to United States of America, Air Force. High temperature coatings based on poly (zinc phosphinates). 4,001,034, Cl. 106-292.000.
Simon, Sydney. Safety tank system. 4,000,726, Cl. 123-134.000.
Simone, Richard B., to National Semiconductor Corporation. BDC corrected adder. 4,001,567, Cl. 235-170.000.
Simplex Filler Co.: *See—*
Lydiksen, George C., 4,000,765.
Simpson, Theodore Frederick, to RCA Corporation. Method of measuring color purity tolerance of a color display tube. 4,001,877, Cl. 358-10.000.
Sims, Claude C., to Marine Resources, Inc. Pressure compensating sound transducer apparatus. 4,001,765, Cl. 340-8.0PC.
Sinclair, Brett Jason; and Youngelson, Harold. Light scanning device. 4,001,705, Cl. 330-4.300.
Singer Company, The: *See—*
Kreissl, Ernst; Vahle, Erwin; and Uhlig, Hans, 4,000,706.
Mahon, Joseph J., 4,001,529.
Sintab Swedinventor AB: *See—*
Lenntoft, Bo Nils Konrad, 4,000,809.
Sisco, George C.: *See—*
Dunigan, Thomas E.; and Sisco, George C., 4,001,287.
Sitterer, Theodor K.; and Valentin, Siegfried, to Altair National Corporation. Slitting machine for corrugated pipe. 4,000,672, Cl. 83-203.000.
Sivyer Steel Corporation: *See—*
Whitney, Richard P., 4,000,859.
Skaggs, Robert Lee: *See—*
Mott, George Edward; and Skaggs, Robert Lee, 4,000,646.
Skelly, Peter T.: *See—*
Proctor, Darryl F.; and Skelly, Peter T., 4,001,512.
Skoyles, Derek Robert; and Sharp, Denis, to U.S. Philips Corporation. Anti-lock vehicle brake systems. 4,001,642, Cl. 317-5.000.
Skubon, Michael J.; Spiwak, John J.; and Naro, Rodney L., to Ashland Oil, Inc. Method for coating sand cores and sand molds. 4,001,468, Cl. 427-134.000.
Slattery Manufacturing (Proprietary) Ltd.: *See—*
Rodger, Alexander J., 4,000,747.
Slobodnik, Andrew J., Jr., to United States of America, Air Force. Low diffraction loss-low spurious response $LiTaO_3$ substrate for surface acoustic wave devices. 4,001,767, Cl. 310-9.500.
Smirnov, Jury Vasilievich: *See—*
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich, 4,001,522.
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich, 4,001,523.
Smith, Daniel M.: *See—*
Knutson, William J.; and Smith, Daniel M., 4,001,711.
Smith, Donald D.: *See—*
Conery, William James; and Smith, Donald D., 4,001,533.
Smith, Frank Patterson, 2nd: *See—*
Bail, John W.; Powell, Ronald Lee; and Smith, Frank Patterson, 2nd, 4,001,824.
Smith, George Watson, to Sangamo Weston Limited. Thermocouple. 4,001,045, Cl. 136-230.000.
Smith, Terry M., to Aeronutronic Ford Corporation. Printed wiring antenna and arrays fabricated thereof. 4,001,834, Cl. 343-754.000.
Smith, Warren M.: *See—*
Cull, Neville L.; and Smith, Warren M., 4,001,376.
Smith, William E.; and Sommerfield, Edmund H., to Dow Chemical Company, The. Hydrolysis of haloaromatic compounds. 4,001,340, Cl. 260-620.000.
SmithKline Corporation: *See—*
Bowman Van Hoeven, Helene E.; Brenner, L. Martin; and Loev, Bernard, 4,001,241.
Brenner, L. Martin; and Brush, Charles K., 4,001,426.
Smiths Industries Limited: *See—*
Dowell, Kenneth J., 4,001,499.
Snam Progetti S.p.A.: *See—*
Re, Luciano; and Caciagli, Valerio, 4,001,333.
Snape, James Ronald: *See—*
Howie, David Malcolm; McKenzie, Roy Victor W.; and Snape, James Ronald, 4,001,760.
Snyder, Ellery P., to Bindicator Company. Method and apparatus for ultrasonic material level measurement. 4,000,650, Cl. 73-290.00V.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Testa, Giorgio; and Pozzi, Mario, 4,001,812.
Societe Anonyme dit: L'Oreal: *See—*
Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,001,141.
S.A. Etablissements Francois Salomon & Fils: *See—*
Salomon, Georges Pierre Joseph, 4,000,567.
Societe Controle Bailey: *See—*
Le Gallais, Jacques J., 4,001,662.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Kalina, Vladimir, 4,001,090.
Socolescu, Grigore O.: *See—*
Dascalescu, Aurelian M.; and Socolescu, Grigore O., 4,001,381.
Solartron Electronic Group Limited, The: *See—*
Withers, Paul Owen; and Metcalf, Eric, 4,001,697.
Somlo, Patricia K.: *See—*
Matlock, William C.; and Somlo, Patricia K., 4,000,734.
Sommerfield, Edmund H.: *See—*
Smith, William E.; and Sommerfield, Edmund H., 4,001,340.
Sondy, Dominic P. Kiln alarm. 4,001,799, Cl. 340-213.00Q.
Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, to American Cyanamid Company. Low molecular weight hydrolyzed polyacrylamide and use thereof as scale inhibitor in water systems. 4,001,161, Cl. 260-29.60H.
Song, Il H., to Richardson Company, The. Transparent solvent and heat resistant terpolymer compositions. 4,001,484, Cl. 526-329.000.
Sony Corporation: *See—*
Aoki, Teruaki; Yamoto, Hisayoshi; Okayama, Masanori; Hirata, Yoshimi; Sato, Shuichi; and Yamada, Takaaki, 4,001,762.
Sorensen, Wayne H.; and Sorenson, John F., to Hoerner Waldorf Corporation. Die cut corner pad. 4,000,843, Cl. 229-14.00C.
Sorenson, John F.: *See—*
Sorensen, Wayne H.; and Sorenson, John F., 4,000,843.
Sorgenfrei, Malachi E.; and Aepli, Otto T., to BASF Wyandotte Corporation. Method of washing glassware and inhibited cleaning solution and additive composition useful therein. 4,001,133, Cl. 252-156.000.
Sorkin, Morris; and Oicles, Jeffrey A., to TRW Inc. Angular velocity indicating apparatus. 4,001,687, Cl. 324-173.000.
Souza, Anthony J., to Woodstream Corporation. Trigger-assembly for rotating-frame type animal traps. 4,000,578, Cl. 43-92.000.
Spannlang, Ronald; and Kagerhuber, Franz, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Roller or roll assembly. 4,000,553, Cl. 29-115.000.
Specht, Edward H.; and O'Mara, James H., to Rohm and Haas Company. Additives to improve the flow of heavy fuels and crude oils. 4,000,986, Cl. 44-62.000.
Spectra-Vision Corporation: *See—*
Fiori, Anthony M.; Fiori, Robert T.; and Nicholas, Thomas C., III, 4,001,882.
Sperry Rand Corporation: *See—*
Boehm, Arthur F., 4,001,786.
Datwyler, George L., 4,000,862.
Lo, David S.; and Paul, Maynard C., 4,001,795.
Spinner, Georg. Variable directional coupler having movable coupling lines. 4,001,730, Cl. 333-10.000.
Spirer, Peter R., to Horizon Industries, Inc. Tufted pile fabric and method of making same. 4,000,707, Cl. 112-410.000.
Spiridonov, Eduard Georgievich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983.

Spitz, Erich: *See—*
Bied-Charreton, Philippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,564.
Bied-Charreton, Phillippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,563.

Spiwak, John J.: *See—*
Skubon, Michael J.; Spiwak, John J.; and Naro, Rodney L., 4,001,468.

Spizzo, Ermes: *See—*
Kurtz, Bernard; and Spizzo, Ermes, 4,000,864.

Spoler, Johannes Gerhard: *See—*
Hannover, Hans-Otto; and Spoler, Johannes Gerhard, 4,000,700.

Spoor, Herbert: *See—*
Kempter, Firtz Erdmann; Sabelus, Guenther; and Spoor, Herbert, 4,001,155.

Sprague Electric Company: *See—*
Brown, John L., 4,001,869.

Spruyt, Harry, to Scott Paper Company. Moisture impervious packaging systems. 4,000,816, Cl. 206-498.000.

Spry, Douglas O., to Eli Lilly and Company. 3-(Substituted)carbonylamino cephem derivatives. 4,001,226, Cl. 260-243.00C.

Squire, William D.: *See—*
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 4,001,773.

Squires, Robert L., to American Electronics Corporation. Ultrasonic rodent control device and method. 4,001,817, Cl. 340-384.00E.

Staba, Edward A., to Olin Corporation. Method for preparing an extrudable priming mixture containing modified karaya gum. 4,001,060, Cl. 149-109.600.

Stacey, Eric J.: *See—*
Gyugyi, Laszlo; Rosa, John; and Stacey, Eric J., 4,001,670.
Gyugyi, Laszlo; Brennen, Michael B.; and Stacey, Eric J., 4,001,671.

Stackhouse, Bill L.; and Taylor, Theodore E., to General Electric Company. Apparatus for establishing communication between a first radio transmitter and receiver and a second radio transmitter and receiver. 4,001,693, Cl. 325-58.000.

Staeubli Ltd.: *See—*
Kleiner, Walter, 4,000,761.

Stahlberger, Bruno; and von Dach, Werner, to Elastin-Werk Aktiengesellschaft. Collagen-containing preparations. 4,001,442, Cl. 426-105.000.

Stamicarbon B.V.: *See—*
Kaasenbrood, Petrus J. C., 4,001,320.

Standard Brands Incorporated: *See—*
Horwath, Robert Otto; and Rotheim, Philip, 4,001,083.
Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, 4,001,084.

Standard Car Truck Co.: *See—*
Geyer, Robert P., 4,000,931.

Standard Oil Company: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,001,317.

Standard Oil Company (Indiana): *See—*
Nelson, James P., 4,001,188.

Standard Pressed Steel Co.: *See—*
Finkelston, Robert J., 4,000,782.

Stanley, Andrew D.: *See—*
Nayfa, James E.; and Stanley, Andrew D., 4,000,536.

Stant Manufacturing Company, Inc.: *See—*
Crute, Billy G.; and Evans, John H., 4,000,828.
Evans, John H., 4,000,633.
Summan, Dennis J., 4,000,632.

State of Rhode Island, Board of Regents for Education of the: *See—*
Mardix, Shmuel; McIlvaine, Paul M.; and Nudelman, Sol, 4,001,627.

Stauffer Chemical Company: *See—*
Baker, Don R.; and Walker, Francis H., 4,001,427.
Baker, Don R.; and Walker, Francis H., 4,001,430.
Letchworth, Peter E.; and Weil, Edward D., 4,001,405.
Petersen, Alfred W., 4,001,383.

Stavropoulos, William S.; and Crouch, Robert D., to Dow Chemical Company, The. Method for determination of triglycerides and glycerol. 4,001,089, Cl. 195-103.50R.

Steel Engineering Company Limited, The: *See—*
Wallace, Trevor Evelyn, 4,000,873.

Steele, Everett T., Jr.: *See—*
Wagner, Joseph P.; and Steele, Everett T., Jr., 4,000,849.

Stein, Marcel. Dustproof and airtight luminaires. 4,001,572, Cl. 240-25.000.

Steinberg, David Herbert: *See—*
Dexter, Martin; and Steinberg, David Herbert, 4,001,299.

Steinkamp, Robert A.; and Grail, Thomas J., to Exxon Research and Engineering Company. Polymers with improved properties and process therefor. 4,001,172, Cl. 260-42.180.

Steinstrasser, Ralf, to Merck Patent Gesellschaft mit beschrankter Haftung. Nematic compounds and mixtures. 4,001,137, Cl. 252-299.000.

Stephan, Raymond C.: *See—*
Rote, Franklin E.; and Stephan, Raymond C., 4,001,012.

Stephenson, Dwight L., to United States of America, Energy Research and Development Administration. Stored program digital process controller. 4,001,557, Cl. 235-151.100.

Stephenson, Robert L.; and Schotthoefer, Jerome W., to Allied Chemical Corporation. Separable fastener with pin latch. 4,000,548, Cl. 24-230.0AL.

Sterling Drug Inc.: *See—*
Alexander, Ernest John; and Mooradian, Aram, 4,001,270.

Sterzer, Fred, to RCA Corporation. Electronic license plate for motor vehicles. 4,001,822, Cl. 343-6.5SS.

Stevens, Arthur Royden, to Centrax Limited. Belt-type abrader with means to compensate for tool wear. 4,000,583, Cl. 51-135.00R.

Stevens, Robert C., to Cordis Corporation. Hemostasis cannula. 4,000,739, Cl. 128-214.400.

Stevenson, George Earley, to Pico Electronics Limited. Floating point calculator with RAM shift register. 4,001,566, Cl. 235-159.000.

Stift, Kurt, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method and apparatus for the reduction of ores, especially iron ores. 4,001,008, Cl. 75-11.000.

Stimson, Paul B. Photographic processing apparatus. 4,001,856, Cl. 354-331.000.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,235.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,252.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,258.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,259.

Stokes, Phillip John: *See—*
Williams, John Llewellyn; and Stokes, Phillip John, 4,001,689.

Storage Technology Corporation: *See—*
Radichel, Frank; and Wirkkanen, Richard, 4,001,818.
Radichel, Frank A., 4,001,686.

Stosak, Ronald J.: *See—*
Trocciola, John C.; Elmore, Dan E.; and Stosak, Ronald J., 4,001,042.

Stout, James T., to Mead Corporation, The. Article carrier. 4,000,813, Cl. 206-187.000.

Stout, James T., to Mead Corporation, The. Article carrier. 4,000,814, Cl. 206-187.000.

Stovall, Leland F., to Exxon Production Research Company. Skimmer fence. 4,000,618, Cl. 61-1.00F.

Strathman, Lyle R.: *See—*
Swanson, Ronald L.; and Strathman, Lyle R., 4,001,716.

Straujups, John E., to Birch Brothers Southern, Inc. Winding apparatus with wrapping arrangement. 4,000,863, Cl. 242-56.00R.

Strike, Donald P., to American Home Products Corporation. Prostaglandin derivatives. 4,001,315, Cl. 260-514.00D.

Strom, Leslie S., to Market Research Corporation of America. Consumer diary. 4,000,915, Cl. 281-31.000.

Strout, Frederick D.; Calle, Jaime; and Herron, Edwin W., to Honeywell Information Systems, Inc. High density data storage on magnetic disk. 4,001,883, Cl. 360-48.000.

Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Magnetic bearing system. 4,000,929, Cl. 308-10.000.

Sturm, Karl, to Hoechst Aktiengesellschaft. Process for the manufacture of 5-sulfamoyl-anthranilic acids. 4,001,284, Cl. 260-397.70R.

Sturm, Ruger & Co. Inc.: *See—*
Ruger, William B.; and Larson, Lawrence L., 4,000,575.

Suchanek, Peter: *See—*
Mennicke, Winfried; Suchanek, Peter; and Vogt, Peter F., 4,000,965.

Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,001,339.

Sugafuji, Akira; Kurimoto, Hiroshi; and Takase, Tadaaki, to Oiles Industry Co., Ltd. Sintered self-lubricating article. 4,000,981, Cl. 29-182.500.

Sugahara, Hirozo: *See—*
Sugimoto, Michio; Yamamoto, Fumitada; Honna, Kosaku; Kurisaki, Konomu; Sugahara, Hirozo; Watanabe, Kiyoshi; Fujimoto, Yasuo; and Ryu, Syoji, 4,001,223.

Sugimoto, Michio; Yamamoto, Fumitada; Honna, Kosaku; Kurisaki, Konomu; Sugahara, Hirozo; Watanabe, Kiyoshi; Fujimoto, Yasuo; and Ryu, Syoji, to Idemitsu Kosan Co., Ltd.; and Nippon Chemiphar Co., Ltd. Adamantane-piperazine derivatives. 4,001,223, Cl. 260-240.00J.

Sugimoto, Yukio, to Matsushita Electric Industrial Co., Ltd. Discrete four-channel disc reproducing system. 4,001,518, Cl. 179-100.4ST.

Sukman, Edwin L.: *See—*
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,001,367.

Sukornick, Bernard: *See—*
Gordon, Joseph; and Sukornick, Bernard, 4,001,380.

Sullivan, Charles I., to Polaroid Corporation. Method for producing zinc anode. 4,001,467, Cl. 427-123.000.

Sullivan, Daryl Dean; and Odle, Herbert Arnold, to Johns-Manville Corporation. Luminaire and luminaire arrangement for lighting the ceiling within a room. 4,001,575, Cl. 240-81.0LD.

Sullivan, Francis R.: *See—*
Clovis, James S.; and Sullivan, Francis R., 4,001,176.

Sumitomo Chemical Company, Limited: *See—*
Hirohashi, Toshiyuki; Sato, Hiromi; Inaba, Shigeho; and Yamamoto, Hisao, 4,001,412.
Hirooka, Masaaki; Fujii, Yoshikazu; and Hata, Kazuhiko, 4,000,958.
Imai, Shozaburo; and Hirooka, Masaaki, 4,001,159.
Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Katayama, Shigenari; and Yamamoto, Hisao, 4,001,312.
Umemura, Takeaki, 4,001,334.

Summan, Dennis J., to Stant Manufacturing Company, Inc. Locking gas cap. 4,000,632, Cl. 70-165.000.

Summers, Thomas Wade, to Brown & Williamson Tobacco Corporation. Apparatus and process for shredding and crimping smoking materials. 4,000,748, Cl. 131-140.00C.

Superior Concrete Accessories, Inc.: *See—*
Courtois, Peter D., 4,000,591.

Superior Outdoor Display, Inc.: *See—*
Olsen, Roy, 4,001,810.

Suresh, Dev D.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,001,317.

Sutcliffe, Brian L. Lathe duplicator. 4,000,766, Cl. 144-144.00R.

Sutter Hospitals Medical Research Foundation: *See—*
Cook, Albert M.; Engleman, Frank A., Jr.; and Simes, James G., 4,001,700.

Sutton, Joel F.: *See—*
Anders, Larry E.; and Sutton, Joel F., 4,000,855.

Sutton, Robert D.: *See—*
Wong, Wilford F.; Hall, Gordon R.; Tsukahira, Tatsuo W.; and Sutton, Robert D., 4,000,869.

Suzuki, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for improving the physical properties of ceramics. 4,001,364, Cl. 264-63.000.

Suzuki, Matsumi; and Itoh, Toshi, to Fuji Xerox Co., Ltd. Half tone reproducing process in facsimile. 4,001,492, Cl. 358-283.000.

Suzuki, Shigeo: *See—*
Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, 4,001,062.

Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, to Tokyo Shibaura Electric Co., Ltd. Apparatus for making electro-luminescent screens for color cathode-ray tubes of continuous phosphor stripes. 4,001,842, Cl. 354-1.000.

Svendsen, Noel A.; and Sylvester, Willard G., to Arthur D. Little, Inc. Headgear support system. 4,000,520, Cl. 2-418.000.

Swanson, Arthur P. Shirt collar strap. 4,000,522, Cl. 2-141.00R.

Swanson, Arthur P. Golf glove. 4,000,903, Cl. 273-166.000.

Swanson, Ronald L.; and Strathman, Lyle R., to Rockwell International Corporation. Variable frequency digital oscillator. 4,001,716, Cl. 331-48.000.

Swanson, Roy T.: *See—*
Scherer, Henry W.; and Swanson, Roy T., 4,001,750.

Swaters, Pieter Dirk; Havinga, Reginoldus; and van der Hauw, Tjerk, to Akzona Incorporated. Compositions curable by exposure to ultra violet light in the presence of chloro-substituted acetophenones. 4,001,098, Cl. 204-159.230.

Sweet, Anthony William, to ITT Industries, Inc. Microprocessor Boolean processor. 4,001,789, Cl. 340-172.500.

Sweeting, Charles William, to United Technologies Corporation. Deflection signal pre-start circuit for a constant speed, stroke-write vector display system. 4,001,806, Cl. 340-324.00A.

Swenck, George F.: *See—*
Scott, Irvin C., Jr.; and Swenck, George F., 4,000,895.

Swift & Company: *See—*
Shank, Joseph L., 4,001,480.

Swodenk, Wolfgang: *See—*
Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,001,303.

Sycor, Inc.: *See—*
Morgan, Samuel A., 4,001,888.

Sylvester, Willard G.: *See—*
Svendsen, Noel A.; and Sylvester, Willard G., 4,000,520.

Symmank, William D., to J. I. Case Company. Multi-engine multi-pump hydraulic summating system. 4,000,616, Cl. 60-420.000.

Synergistics, Inc.: *See—*
Kelly, William, deceased; Kelly, Monica, personal representative; Kelly, John, personal representative; and Halpern, Alfred, 4,001,311.

Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 4,001,301.

Syntex (U.S.A.) Inc.: *See—*
Edwards, John A., 4,001,421.
Muchowki, Joseph M.; and Fried, John H., 4,001,295.
Rooks, Wendell H., II, 4,001,407.
Wing, James C.; and White, Jack V., 4,001,593.

Synthelabo: *See—*
Najer, Henry; and Pascal, Yves Robert Alain, 4,001,251.

Systron Donner Corporation: *See—*
Hrbacek, Benny A.; and Grovenstein, Lewis F., Jr., 4,001,695.

Taguchi, Sadanori: *See—*
Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, 4,001,481.

Taiho Kogyo Co., Ltd.: *See—*
Ueda, Hiroshi, 4,000,982.

Tajima, Kunio; Kawakami, Touhei; and Hayashi, Seiichi, to Hitachi, Ltd. Information recording apparatus. 4,000,945, Cl. 355-45.000.

Takada, Mamoru: *See—*
Arima, Sumitaro; Oda, Minoru; Miyashita, Kyoichi; and Takada, Mamoru, 4,001,589.

Takahashi, Kazutoshi: *See—*
Miyazaki, Ken; Takahashi, Kazutoshi; and Omino, Mamoru, 4,001,785.

Takahashi, Kiyoshi: *See—*
Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu; and Takahashi, Kiyoshi, 4,000,940.

Takahashi, Tamotsu, to Copal Company Limited. Photographic camera for use with film cartridge. 4,001,849, Cl. 354-207.000.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener with emergency opening means. 4,000,545, Cl. 24-205.00R.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Slider for concealed slide fasteners. 4,000,546, Cl. 24-205.10R.

Takasawa, Yoshio: *See—*
Toyama, Teruhiko; and Takasawa, Yoshio, 4,001,004.

Takase, Tadaaki: *See—*
Sugafuji, Akira; Kurimoto, Hiroshi; and Takase, Tadaaki, 4,000,981.

Takeda Chemical Industries, Ltd.: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,001,199.
Ogino, Akira; Nakai, Yoshikazu; Nakayama, Takeo; and Miyamura, Koji, 4,001,153.

Takegami, Shigeru: *See—*
Nomoto, Yoshihisa; Takegami, Shigeru; Nakakubo, Koichi; and Yoneyama, Takao, 4,001,503.

Takenaka, Shigeo: *See—*
Tsuneta, Asahide; and Takenaka, Shigeo, 4,001,018.

Taketa, Katsumi; Nitta, Hirotoshi; and Sato, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Ground fault detector. 4,001,648, Cl. 317-18.00D.

Taketomi, Shigehisa: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,001,199.

Takeuchi, Yasuhisa; and Iizuka, Haruhiko, to Nissan Motor Co., Ltd. Vehicle skid control system including vehicle speed sensor. 4,000,928, Cl. 303-103.000.

Takigawa, Tomoshi: *See—*
Okajima, Hidekazu; Takigawa, Tomoshi; Hirata, Noritsugu; Toyama, Masamichi; and Ichiyanagi, Toshikazu, 4,000,941.

Takman, Bertil H.: *See—*
Adams, Herbert J. F.; and Takman, Bertil H., 4,001,413.

Tanaka, Hiroshi: *See—*
Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, 4,001,842.

Tanaka, Shogo: *See—*
Oguchi, Noboru; Hiramatsu, Takashi; Igami, Ikuo; Aoki, Akira; Tanaka, Shogo; Seki, Toshiro; and Inoue, Takao, 4,000,960.

Tanaka, Susumu: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.

Tanaka, Toshio: *See—*
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, 4,001,308.

Tanikella, Murty S.; and von Susani, Odorich, to Du Pont de Nemours, E. I., and Company. Fibers of acid-dyeable polyester having tetramethylpiperidine groups attached through oxyalkalene linkages to ends of polymer chains. 4,001,189, Cl. 260-75.00N.

Tanikella, Murty S.; and von Susani, Odorich, to Du Pont de Nemours, E. I., and Company. Acid-dyeable fibers of polyester modified with tetramethylpiperidine polyether glycols. 4,001,190, Cl. 260-75.00N.

Tanner, Howard A.: *See—*
Elmore, Glenn V.; and Tanner, Howard A., 4,001,039.

Tartarintsev, Vladimir Mikhailovich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983.

Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, to Hitachi, Ltd. Superconductive elements and method for producing the same. 4,001,481, Cl. 428-469.000.

Tatemichi, Hidemaro: *See—*
Ogasawara, Takahisa; Senzaki, Yoshimichi; Kato, Hiroyuki; and Tatemichi, Hidemaro, 4,001,097.

Tauchmann, Reinhard, to Dornier GmbH. Heating device for flow sondes. 4,000,647, Cl. 73-181.000.

Taurus Gumiipari Vallalat: *See—*
Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.

Tauszig, Julio G., to A. B. Dick Company. Devices for the copying of images by sequential sweeping. 4,001,495, Cl. 358-294.000.

Tavazzani, Carlo: *See—*
Severini, Febo; Tavazzani, Carlo; and Delle Ville, Piero, 4,001,349.

Taylor, Alan K.: *See—*
McDonald, John C.; Henrickson, Gary C.; Taylor, Alan K.; and Settle, William A., 4,001,509.

Taylor, Theodore E.: *See—*
Stackhouse, Bill L.; and Taylor, Theodore E., 4,001,693.

Tecco, Charles; and Loughley, William A. Safety closure with removable lid for containers. 4,000,839, Cl. 222-540.000.

Teijin Limited: *See—*
Hamana, Isao; Fujiwara, Yoshio; and Kumakawa, Shiro, 4,001,479.
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, 4,001,308.

Telan Corporation: *See—*
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Teledyne, Inc.: *See—*
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Telefonaktiebolaget L M Ericsson: *See—*
Bylund, Per Gunnar; and Lyberg, Bertil, 4,001,680.

Teletype Corporation: *See—*
Herbst, Wayne R.; and Mika, Paul L., 4,001,884.

Temple, James E. Switch assemblies. 4,001,534, Cl. 200-160.000.

Tench, Michael Dennis Roy, to Plessey Handel und Investments A.G. Drive field for circular magnetic domain devices. 4,001,792, Cl. 340-174.0TF.

Terabayashi, Gosaku, to Toyota Jidosha Kogyo Kabushiki Kaisha. One-touch action type power window. 4,001,661, Cl. 318-264.000.

Terasita, Takaaki: *See*—
Akimoto, Taizo; Terasita, Takaaki; and Watanabe, Shigeru, 4,001,594.

Terracol, Claude; and Schueller, Pierre, to Merlin Gerin. Circuit interrupter having an electromagnetic repulsion device. 4,001,738, Cl. 335-16.000.

Testa, Giorgio; and Pozzi, Mario, to Societa Italiana Telecomunicazioni Siemens S.p.A. Method of and means for quantizing analog-voltage samples. 4,001,812, Cl. 340-347.0NT.

Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, to Hoechst Aktiengesellschaft. Derivatives of the 1,2-diarylethylene- and pharmaceutical compositions thereof. 4,001,431, Cl. 424-327.000.

Texaco Inc.: *See*—
Mott, George Edward; and Skaggs, Robert Lee, 4,000,646.

Texas Instruments Incorporated: *See*—
Anderson, Philip Leroy; and Gartman, William Wesley, 4,000,717.
Bray, William Edward, 4,001,663.
Culpepper, Jerry W., 4,001,828.
Dover, R. Thomas; and Hemmi, Christian O., 4,001,835.
Hofer, Helmut H., 4,001,770.

Thayer, Stephen C., to Panel Technology, Inc. Segmented gas discharge display panel. 4,001,629, Cl. 313-517.000.

Theissen, Robert J., to Mobil Oil Corporation. Herbicidal compositions comprising halophenoxy benzoic acid esters. 4,001,005, Cl. 71-108.000.

Therm-O-Disc Incorporated: *See*—
Deubel, Bernard S., 4,001,751.

Thettu, Raghulinga R., to Xerox Corporation. Cleaning apparatus for a heat and pressure fuser. 4,000,963, Cl. 432-60.000.

Thibodaux, Joseph G., Jr.; and Lewis, Donald J., to United States of America, National Aeronautics and Space Administration. Solid propellant rocket motor and method of making same. 4,000,682, Cl. 86-1.00R.

Thiemann, Karl-Heinz: *See*—
Danielmeyer, Hans-Gunter; Jeser, Jean Pierre; Kruhler, Walter-Wolfgang; Thiemann, Karl-Heinz; and Huber, Gunter, 4,001,704.

Thomas, Francis J.; Kirchhein, Albert; and Porawski, Donald J., to Bendix Corporation, The. Voter circuit including averaging means. 4,001,605, Cl. 307-235.00F.

Thomas, Frank A. Method of recovering nutrients from cheese whey and purifying the effluent. 4,001,198, Cl. 260-112.00R.

Thomas, Gordon D.; and Schwoerer, Jerome L., to Kimberly-Clark Corporation. Nonwoven reinforced cellulosic material and method of preparation. 4,001,472, Cl. 428-109.000.

Thomas, Herbert: *See*—
Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, 4,001,411.

Thomas Industries, Inc.: *See*—
Porter, David H.; and Bray, Douglas, 4,001,574.

Thomas, Marion E.: *See*—
Veeneman, John L.; Thomas, Marion E.; and Deveraux, Harry R., 4,001,451.

Thomas, McKinley B., to United States Steel Corporation. Plate mill finishing stand roll latch ring. 4,000,638, Cl. 72-238.000.

Thompson, John: *See*—
Grundy, David Latham; and Thompson, John, 4,001,694.

Thomson-Brandt: *See*—
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Thomson, Colin: *See*—
Danilewicz, John C.; Evans, Anthony G.; Ham, Allan L.; and Thomson, Colin, 4,001,422.

Thomson-CSF: *See*—
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Bied-Charreton, Phillippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,563.
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Chesneau, Rene; and Martin, Jean-Marc, 4,001,832.
Chesneau, Rene; and Martin, Jean-Marc, 4,001,833.
d'Auria, Luigi; Huignard, Jean-Pierre; Reboul, Jean Philippe; and Le Carvennec, Francois, 4,001,635.
Le Parquier, Guy, 4,001,875.

Thomson, James E., to Western Stamping Corporation. Type bar actuating mechanism. 4,000,802, Cl. 197-27.000.

Thorn Electrical Industries Limited: *See*—
Howles, Donald Arthur; and Page, Robert Brian, 4,001,623.

Tiger, Menachem: *See*—
Kramer, Charles E.; and Tiger, Menachem, 4,000,976.

Tim-Wo Chu, Daniel; and Garmaise, David Lyon, to Abbott Laboratories. 3,4-Dimethyl-5-isoxazolylsulfamylaniline. 4,001,265, Cl. 260-307.00H.

Timmermans, Abraham: *See*—
Schat, Bralt Renze; and Timmermans, Abraham, 4,001,625.

Tissier, Jacques. Cleaning device. 4,000,538, Cl. 15-320.000.

Tjernstrom, Ove; and Zetterlund, Uno, to Allmanna Svenska Elektriska Aktiebolaget. Direct-cooled tape layer winding. 4,001,746, Cl. 336-62.000.

Toagosei Chemical Industry Co., Ltd.: *See*—
Ogasawara, Takahisa; Senzaki, Yoshimichi; Kato, Hiroyuki; and Tatemichi, Hidemaro, 4,001,097.

Tohoku Electric Power Company, Inc.: *See*—
Arima, Sumitaro; Oda, Minoru; Miyashita, Kyoichi; and Takada, Mamoru, 4,001,589.

Tohyama, Yoshikuni: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,000,942.

Tokutomi, Kiyoshi. Fan with wide curved blades. 4,000,955, Cl. 415-183.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, 4,001,842.
Tsuneta, Asahide; and Takenaka, Shigeo, 4,001,018.

Tomaschko, Heinrich: *See*—
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Tone, Junsuke: *See*—
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Toray Industries, Inc.: *See*—
Tsutsumi, Tadao; Kato, Nobuo; Morikawa, Masanobu; Aoyama, Toshikazu; and Nagai, Kazumi, 4,001,177.

Toru, Takeshi: *See*—
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Toshimitsu, Yoshihiko: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; and Aoki, Takashi, 4,000,785.

Tottori, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. AC drive discharge type display apparatus. 4,001,636, Cl. 315-169.0TV.

Toyama, Masamichi: *See*—
Okajima, Hidekazu; Takigawa, Tomoshi; Hirata, Noritsugu; Toyama, Masamichi; and Ichiyanagi, Toshikazu, 4,000,941.

Toyama, Teruhiko; and Takasawa, Yoshio, to Mitsui Toatsu Chemicals, Incorporated. Synergistic herbicidal composition for paddy fields. 4,001,004, Cl. 71-100.000.

Toyo Kogyo Co., Ltd.: *See*—
Morishita, Tsuyoshi; and Yamada, Toshio, 4,000,980.

Toyomatsu, Masafumi: *See*—
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Kubota, Tatsushi; and Fujiwara, Akinori, 4,001,532.
Noguchi, Masaaki; and Sanda, Shougo, 4,000,731.
Terabayashi, Gosaku, 4,001,661.

Trechsel, Ulrich, to Pathophysiologisches Institut der Universitat Bern. Sieve filtration apparatus. 4,001,117, Cl. 210-180.000.

Tretter, James R.: *See*—
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Trevisan, Enzo: *See*—
Patron, Luigi; Mazzuco, Pier Luigi; Veneto, Favato; Trevisan, Enzo; and Niero, Ennio, 4,001,485.

Trocciola, John C.; Elmore, Dan E.; and Stosak, Ronald J., to United Technologies Corporation. Screen printing fuel cell electrolyte matrices using polyethylene oxide as the inking vehicle. 4,001,042, Cl. 427-115.000.

Troutman, Bruce L.; and Yount, Emory N., to Rockwell International Corporation. Counter arrangement and associated test circuit for an electronic timing device. 4,001,553, Cl. 235-92.0MS.

TRW Inc.: *See*—
Archer, John S.; and McCracken, Harry J., 4,001,836.
McDonald, John C.; Henrickson, Gary C.; Taylor, Alan K.; and Settle, William A., 4,001,509.
Sorkin, Morris; and Oicles, Jeffrey A., 4,001,687.

Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Sagami Chemical Research Center. α-Alkyl(or aryl)thio-5-hydroxytryptophan derivative and the preparation process thereof. 4,001,276, Cl. 260-326.12R.

Tsuchiya, Osamu: *See*—
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,001,208.

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Tsumura, Nobuzo; and Kasumi, Takafumi, to Director of National Food Research Institute. Method of isomerizing glucose with enzyme immobilized within microbial cell. 4,001,082, Cl. 195-31.00F.

Tsunemitsu, Hideo, to Nippon Electric Company, Ltd. Semiconductor device. 4,001,871, Cl. 357-54.000.

Tsuneta, Asahide; and Takenaka, Shigeo, to Tokyo Shibaura Electric Co., Ltd. Method for making a stripe screen on a face plate of a cathode ray tube by rotating correction lens. 4,001,018, Cl. 96-36.100.

Tsunoda, Terue: *See*—
Saiki, Atsushi; Sato, Kikuji; Harada, Seiki; Tsunoda, Terue; and Oba, Yoichi, 4,001,870.

Tsutsumi, Tadao; Kato, Nobuo; Morikawa, Masanobu; Aoyama, Toshikazu; and Nagai, Kazumi, to Toray Industries, Inc. Flame-retarding polyamide composition. 4,001,177, Cl. 260-45.8NT.

Tu, King-Ning: *See—*
Baglin, John E.; DiStefano, Thomas H.; and Tu, King-Ning, 4,001,049.
Tuckey, Charles H., to Walbro Corporation. Cover plate for a carburetor body. 4,001,354, Cl. 261-35.000.
Tungseth, Barry F.; and Lindlof, James A., to Minnesota Mining and Manufacturing Company. Adhesive compositions comprising aromatic process oil and block copolymer. 4,001,167, Cl. 260-33.6AQ.
Turk, Gunter; and Welsch, Joseph, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process of making superfine amorphous high structural silicic acid. 4,001,379, Cl. 423-339.000.
Turner, James E., to Warner-Lambert Company. Blood gas control. 4,001,142, Cl. 252-408.000.
TWM Manufacturing Company, Inc.: *See—*
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Tyler, Hugh J., to Robertshaw Controls Company. Damper actuator. 4,000,663, Cl. 74-424.8VA.
UBE Industries, Ltd.: *See—*
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Uchida, Masakatsu: *See—*
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Uemoto, Kunihiko; Shichiji, Satoru; and Amemiya, Yoshinori, to Japan Gasoline Co., Ltd.; and Nikki Chemical Co., Ltd. Low-temperature steam reforming process for hydrocarbons. 4,000,988, Cl. 48-214.00A.
Uemoto, Kunihiko: *See—*
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Ule, Louis A.; and Michelson, Gunnar P. High speed engine valve actuator. 4,000,756, Cl. 137-596.170.
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Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Sakunaga, Kenichi; and Umemura, Eiji, 4,000,605.
Umemura, Takeaki, to Sumitomo Chemical Company, Limited. Racemization of optically active allethrolone. 4,001,334, Cl. 260-586.00R.
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, to Zaidan Hojin Biseibutsu Kagaku Kenkyo Kai. 1-N-[(S)-α-hydroxy-ω-aminoacyl]. 4,001,208, Cl. 536-17.000.
Umezawa, Hamao: *See—*
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Unruh, Dale H.; and Proksch, Frederick D., to Caterpillar Tractor Co. Vehicle provided with a fluidic accelerometer. 4,000,910, Cl. 280-710.000.
Unruh, Earl L. Mobile home skirting side panel. 4,001,361, Cl. 264-51.000.
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Uyetake, Tadao; Higa, Teikichi; Orillo, Stephen, Jr.; and Nakano, Gregory, to United States of America, Navy. In-situ lapping apparatus for gate valves. 4,000,584, Cl. 51-241.0VS.
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Vaida, Peter P. Measuring instrument. 4,001,063, Cl. 156-73.100.

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Vance, Richard A.; and Walworth, Robert S., to American Seating Company. System for mounting articles to telescopic structures. 4,000,586, Cl. 52-9.000.

Vandenberghe, Antoon Leon; Heugebaert, Frans Clement; and Poot, Albert Lucien, to AGFA-GEVAERT N.V. Method and materials for thermoplastic recording. 4,001,026, Cl. 96-114.100.

van der Hauw, Tjerk: *See—*
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van der Lely, Cornelis. Space-bounding sections for forming a building or part thereof, and methods of erecting such a building. 4,000,588, Cl. 52-71.000.

van der Werf, Jan Evert: *See—*
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VanDril, William A., to Whiting Corporation. Cupola furnace waste gas recuperative system and method for operating same. 4,000,885, Cl. 266-83.000.

van Eijl, Antonie Peter Lambertus: *See—*
Drop, Peter Cornelis; Endevoets, Willy Joseph Catharina; van Eijl, Antonie Peter Lambertus; and Jack, Alexander Gray, 4,001,626.

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Van Paesschen, August Jean; Van Gossum, Lucien Janbaptist; and Priem, Jan Jozef, to AGFA-GEVAERT N.V. Adhesion of hydrophilic layers on polyester film. 4,001,023, Cl. 96-87.00A.

van Roessel, Frederik Johannes, to North American Philips Corporation. Straylight compensation circuit and blanking circuit for same. 4,001,502, Cl. 358-165.000.

Van Sluys, Robert Nestor Joseph, to U.S. Philips Corporation. Device for optionally realizing two mutually complementary functions. 4,001,731, Cl. 333-14.000.

van Tongeren, Hendricus Franciscus Joannes Jacobus; van der Werf, Jan Evert; and Heuvelmans, Jean Johan, to U.S. Philips Corporation. Device provided with a gas and/or vapor discharge tube. 4,001,633, Cl. 315-47.000.

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Veeneman, John L.; Thomas, Marion E.; and Deveraux, Harry R., to American Potato Company. Process for deep fat frying comestibles in an automatic deep fat fryer. 4,001,451, Cl. 426-438.000.

Veleber, John R., to R F L Industries, Inc. Test set for measuring impedance and power dissipation of a crystal. 4,001,675, Cl. 324-56.000.

Velo, Henri Jan: *See—*
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Vick, Ralph L., to Bendix Corporation, The. Quieting means for a fluid flow device. 4,000,878, Cl. 251-127.000.

Vickers Limited: *See—*
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Visual Components, Inc.: *See—*
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Visual Data Corporation: *See—*
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Voegeli, Otto, to International Business Machines Corporation. Method and apparatus for controlled generation of wall topology in magnetic domains. 4,001,794, Cl. 340-174.0TF.

Voegeli, Otto, to International Business Machines Corporation. Bubble lattice structure with barrier. 4,001,796, Cl. 340-174.0TF.

Vogel, Ludwig: *See—*
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Vollmer, Karl-Otto: *See—*
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Vollmer, Rudolf: *See—*
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von Bonin, Wulf; Muller, Friedhelm; and Schon, Nikolaus, to Bayer Aktiengesellschaft. Anionic sizes. 4,001,193, Cl. 526-26.000.

von Dach, Werner: *See—*
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Voss, Peter, to Siemens Aktiengesellschaft. Light controllable thyristor. 4,001,865, Cl. 357-38.000.

Vowinkel, Hans; and Rober, Hans, to Hoechst Aktiengesellschaft. Process and device for testing the thermostability of shaped articles of thermoplastic material. 4,000,642, Cl. 73-15.00R.

Voyles, Gerald A.; and Davies, William D., to P. R. Mallory & Co., Inc. Compressible intermediate layer for encapsulated electrical devices. 4,001,655, Cl. 317-230.000.

Voyles, Gerald A., to P. R. Mallory & Co., Inc. Capacitor having a plurality of anode risers for low impedance at high frequency. 4,001,656, Cl. 317-230.000.

W. R. Grace & Co.: *See—*
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Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, to Minolta Camera Kabushiki Kaisha. Devices for controlling the heating of fuser roll apparatus. 4,001,545, Cl. 219-216.000.

Wade, John A. Collapsible carrier for kegs. 4,000,922, Cl. 294-16.000.

Wagman, Gerald H.: *See—*
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Wagner, Kuno; and Braden, Rudolf, to Bayer Aktiengesellschaft. Organic isocyanate compositions and production thereof. 4,001,290, Cl. 260-453.00A.

Wagner, Louis E.: *See—*
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Wahlbeck, Hans Gustav Erik. Pendant jewel chain. 4,000,627, Cl. 63-2.000.

Wahlberg, Eric C. Writing instrument. 4,000,950, Cl. 401-32.000.

Wakeman, Thomas G.; and Nash, Dudley O., to General Electric Company. Cooling system for a thrust vectoring gas turbine engine exhaust system. 4,000,612, Cl. 60-230.000.

Wakimasu, Mitsuhiro: *See—*
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Waldman, Herbert H.; and Meri, Kalju. Hold circuit for telephones. 4,001,520, Cl. 179-81.00R.

Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Production of ω-formyl carboxylic acid esters. 4,001,303, Cl. 260-483.000.

Walker, Brooks. Vehicle retrofit gasoline evaporation control device. 4,000,727, Cl. 123-136.000.

Walker, Francis H.: *See—*
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Baker, Don R.; and Walker, Francis H., 4,001,430.

Walker, Richard C.: *See—*
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Wallace, Trevor Evelyn, to Steel Engineering Company Limited, The. Mounting for rock drills. 4,000,873, Cl. 248-2.000.

Wallin, Erik W.; and Lindquist, Gunnar, to Barracudaverken Aktiebolag. Camouflage material. 4,001,827, Cl. 343-18.00A.

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Walz, Alfred H.; and Hahn, Paul-Jurgen, to Walz, Alfred. Process for the manufacture of fibers from fusible materials. 4,001,357, Cl. 264-12.000.

Wang, Chih Chun; Lausman, Thomas Clifford; and Bates, Ronald Frank, to RCA Corporation. Photosensitive camera tube target primarily of lead monoxide. 4,001,099, Cl. 204-164.000.

Wang, Sherman S.: *See—*
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Warp, Rick A.; Morton, John L., Jr.; and Azmoon, Majid, to Hewlett-Packard Company. Vacuum-buffered bidirectional paper drive system. 4,000,803, Cl. 197-133.00R.

Warren Automatic Tool Co.: *See—*
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Watanabe, Kiyoshi: *See—*
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Waterman, Raymond C., Jr.: *See—*
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Watkins-Johnson Company: *See—*
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Watkins, Laurence S., to Western Electric Company, Inc. Photomask inspection by optical spatial filtering. 4,000,949, Cl. 356-165.000.

Watson, David; and Brown, Arthur William, to Associated Portland Cement Manufacturers Limited, The. Treatment of waste products from Portland cement manufacture. 4,001,030, Cl. 106-100.000.

Watt, Richard E., to Cubic Corporation. Ambiguity free digital averaging phase meter. 4,001,682, Cl. 324-83.00D.

Watts Regulator Company: *See—*
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Way, Allan S.; and Pratt, Stanley L., to Beckman Instruments, Inc. Stepper motor tracking accuracy control for spectrophotometers. 4,000,946, Cl. 356-89.000.

Weaver, Kenneth. Uterine anteverter. 4,000,743, Cl. 128-303.00R.

Webber, Robert C. Liquid convection fluid heat exchanger for refrigeration circuit. 4,000,626, Cl. 62-175.000.

Weber, Charles A., to Bock Products, Inc. Hitch mechanism for towing and maneuvering mobile homes and modular home sections. 4,000,911, Cl. 280-468.000.

Weber, Peter: *See—*
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Weber, William H. Gutter structure. 4,000,587, Cl. 52-16.000.

Weeks, Charles B.; and Choate, Paul V., to Norris Industries, Inc. Trash compactor. 4,000,689, Cl. 100-229.00A.

Weigl, Erwin, to Gertsch AG. Ski binding component. 4,000,908, Cl. 280-623.000.

Weigt, Gerald I.: *See—*
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Weimer, Charles Perry, to International Paper Company. One-piece partition. 4,000,844, Cl. 229-15.000.

Weimer, Paul Kessler, to RCA Corporation. Signal processing circuits for charge-transfer, image-sensing arrays. 4,001,501, Cl. 358-160.000.

Weimer, Paul Kessler, to RCA Corporation. Charge transfer color imagers. 4,001,878, Cl. 358-41.000.

Weinberger, Howard L., to Hughes Aircraft Company. FM to AM converter. 4,001,729, Cl. 332-1.000.

Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., to Schering Corporation. Antibiotic G-52 and method for the production thereof. 4,001,209, Cl. 536-17.000.

Weirich, H. Paul: *See—*
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Weisigk, Gunther; Schmah, Karlheinz; and Berger, Harald, to Siemens-Albis Aktiengesellschaft. Apparatus for feeding and controlling ringing currents in telecommunication systems. 4,001,516, Cl. 179-84.00R.

Weiss, Herbert; Maurer, Otto; and Kolbow, Peter, to Siemens Aktiengesellschaft. Thermoelement on semiconductor base. 4,001,046, Cl. 136-205.000.

Welch Foods Inc.: *See—*
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Welch, John F.; and Civardi, Frank P., to General Electric Company. Extraction separation. 4,001,341, Cl. 260-621.00B.

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Wells, Preston A., Jr. Method for the manufacture of furfural using hydrogen chloride. 4,001,283, Cl. 260-347.900.

Wells, Rex C.: *See—*
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Welstead, William John, Jr., to A. H. Robins Company, Incorporated. 1-Cyclopropyl-1-phenyl-ω-amino-1-alkanols and 1-lower-alkylacyl derivatives as analgetics. 4,001,429, Cl. 424-311.000.

Wendt, Gerhard R.; and Winkley, Michael W., to American Home Products Corporation. Aminoalkyl ethers of 2,2'- and 3,3'-dihydroxybenzil. 4,001,214, Cl. 260-239.00B.

Wendt, Gerhard R.: *See—*
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Western Gear Corporation: *See—*
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Western Stamping Corporation: *See—*
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Westfall, James E., to Continental Can Company, Inc. Press-on twist-off infestation-proof closure for oxygen sensitive products. 4,000,825, Cl. 215-318.000.

Westinghouse Air Brake Company: *See—*
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Westinghouse Electric Corporation: *See—*
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Wethington, Charles A., to Deering Milliken Research Corporation. Carpet machine. 4,001,071, Cl. 156-435.000.

Whirlpool Corporation: *See—*
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White, Jack V.: *See—*
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White, Ralph L., Jr., to Morton-Norwich Products, Inc. 3-(Aminoacyl)-1- [5-(substituted phenyl)furfurylidene]amino hydantoins and process for their preparation thereof. 4,001,222, Cl. 260-240.00G.

White, William S., to Robert H. Peterson Company. Solid wick lighter. 4,000,732, Cl. 126-92.00R.

Whitehouse, Harper J.: *See—*
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Whiting Corporation: *See—*
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Whitley, Edmond R., to General Electric Company. Apparatus for heating and dispensing flowable material. 4,000,834, Cl. 222-180.000.

Whitney, Richard P., to Sivyer Steel Corporation. Two-piece hammer. 4,000,859, Cl. 241-194.000.

Whitney, Robert E.: *See—*
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Wick, Arnold, to Ciba-Geigy Corporation. Process for bulk dyeing high molecular organic compounds. 4,001,170, Cl. 260-40.00P.

Wiechert, Rudolf: *See—*
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Wieder, Horst K.; and Wieder, Klaus A. Device for severing tubular members. 4,000,561, Cl. 30-124.000.

Wieder, Klaus A.: *See—*
Wieder, Horst K.; and Wieder, Klaus A., 4,000,561.

Wifo Wissenschaftliches Forschungs-Institut A.G.: *See—*
Heinzer, Paul; and Wulz, Helmut, 4,001,544.

Wiklund, Klas Rudolf, to AGA Aktiebolag. Method and device for measuring the correction factor. 4,000,652, Cl. 73-336.000.

Wilcox, Milton E., to National Semiconductor Corporation. Emitter load switching circuit. 4,001,603, Cl. 307-232.000.

Wild, Jost: *See—*
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Wilhelm, Henry Gilmer. Rapid-flow washer for photographic sheet material. 4,001,855, Cl. 354-324.000.

Wilkins & Associates, Inc.: *See—*
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Wilkinson Sword Limited: *See—*
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Will, Peter M.: *See—*
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William F. Shepherd, Inc.: *See—*
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William H. Rorer, Inc.: *See—*
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Williams, Jillian A.; and James, Ronald, to Wilkinson Sword Limited. Pressurized dispensers. 4,000,836, Cl. 222-399.000.

Williams, John Llewellyn; and Stokes, Phillip John, to British Nuclear Fuels Limited. Device for indicating the direction of rotation of a body driven by a rotating electrical machine. 4,001,689, Cl. 324-34.00D.

Williams, Merl A., to Central Soya Company, Inc. Method of preparing animal food pellets. 4,001,452, Cl. 426-454.000.

Williamson, Calvin C. Method of and apparatus for continuous casting. 4,000,771, Cl. 164-64.000.

Wills, David G.: *See—*
Shead, Terence H. C.; and Wills, David G., 4,000,877.

Wilson, Michael A.; Gee, Gordon E.; and Momparler, Fred J., to Electro Corporation. Linear oscillator for proximity sensor. 4,001,718, Cl. 331-65.000.

Winchell, Harry S.: *See—*
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Wing, James C.; and White, Jack V., to Syntex (U.S.A.) Inc. Axial tomographic scanner having means for supporting X-ray source cables. 4,001,593, Cl. 250-522.000.

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Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. Composition for and method of treating diseases caused by protozoa. 4,001,415, Cl. 424-263.000.

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B 24,017	3,914,140	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 290,328	3,924,838	Dec. 9, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,369	3,925,245	Dec. 9, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 314,049	3,920,588	Nov. 18, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,917	3,925,494	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 318,195	3,915,699	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,452	3,925,083	Dec. 9, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 320,603	3,915,571	Oct. 28, 1975	B 346,044	3,988,405	Oct. 26, 1976
B 321,018	3,921,623	Nov. 25, 1975	B 346,165	3,913,293	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,682	3,924,973	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,506	3,916,021	Oct. 28, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,719	3,915,715	Oct. 28, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,443	3,927,405	Dec. 16, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 361,569	3,914,554	Oct. 21, 1975	B 384,658	3,913,452	Oct. 21, 1975
B 361,604	3,922,702	Nov. 25, 1975	B 384,773	3,915,416	Oct. 28, 1975
B 361,734	3,915,764	Oct. 28, 1975	B 385,210	3,913,406	Oct. 21, 1975
B 362,589	3,914,012	Oct. 21, 1975	B 386,403	3,924,895	Dec. 9, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 386,592	3,925,305	Dec. 9, 1975
B 363,337	3,928,639	Dec. 23, 1975	B 387,039	3,924,510	Dec. 9, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 365,371	3,988,181	Oct. 26, 1976	B 389,726	3,921,010	Nov. 18, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 393,347	3,985,800	Oct. 12, 1976
B 369,607	3,923,786	Dec. 2, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976	B 394,188	3,924,591	Dec. 9, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 406,800	3,952,708	Apr. 27, 1976
B 383,465	3,927,412	Dec. 16, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 408,380	3,984,172	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 408,487	3,924,046	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975
B 409,026	3,925,497	Dec. 9, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,657	3,927,362	Dec. 16, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 425,770	3,989,817	Nov. 2, 1976
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,385	4,001,104	Jan. 4, 1977
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,982,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976	B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976	B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976	B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976	B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976	B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976	B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976	B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976	B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977	B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976	B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976	B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976	B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976	B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976	B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976	B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976	B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976	B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976	B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976	B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 4TH DAY OF JANUARY, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Baitinger, Utz G.; Folberth, Otto G.; Haug, Werner O.; and Kroell, Karl E., to International Business Machines Corporation. Narrow channel field effect transistor. T954,008, 1-4-77, Cl. 357-23.000.

Basdekas, Demetrios L.; and Bell, George I., to United States of America, Atomic Energy Commission. Reactivity control system for nuclear reactors by magnetic means. T954,003, 1-4-77, Cl. 176-86.00R.

Bell, George I.: *See—*
Basdekas, Demetrios L.; and Bell, George I., T954,003.

Brunner, Friedrich C.; Frasch, Peter U.; Schwerdt, Friedrich W.; and Vogtmann, Theodor P., to International Business Machines Corporation. Method of coating oxidized inorganic substrates with polyimide. T954,010, 1-4-77, Cl. 427-335.000.

Castrucci, Paul P.; Collins, Robert H.; and Deverse, Frank T., to International Business Machines Corporation. Process for increasing mask life. T954,002, 1-4-77, Cl. 96-38.300.

Collins, Robert H.: *See—*
Castrucci, Paul P.; Collins, Robert H.; and Deverse, Frank T., T954,002.

Davis, Burns; Overton, James R.; and Schulken, Roger M., Jr. Process for preparing containers using branched polyesters. T954,005, 1-4-77, Cl. 264-98.000.

Deverse, Frank T.: *See—*
Castrucci, Paul P.; Collins, Robert H.; and Deverse, Frank T., T954,002.

Dickason, William C.; Jackson, Winston J., Jr.; and Wooten, Willis C., Jr. Process for preparing containers using polyesters. T954,004, 1-4-77, Cl. 264-98.000.

Firestone Tire and Rubber Company, The: *See—*
Smith, Robert C., T954,012.

Folberth, Otto G.: *See—*
Baitinger, Utz G.; Folberth, Otto G.; Haug, Werner O.; and Kroell, Karl E., T954,008.

Frasch, Peter U.: *See—*
Brunner, Friedrich C.; Frasch, Peter U.; Schwerdt, Friedrich W.; and Vogtmann, Theodor P., T954,010.

General Electric Company: *See—*
Nevin, Robert Y.; and Scheer, James Allen, T954,007.

Hassitt, Anthony, to International Business Machines Corporation. Method and apparatus for operating computer apparatus in response to program statements. T954,011, 1-4-77, Cl. 444-1.000.

Haug, Werner O.: *See—*
Baitinger, Utz G.; Folberth, Otto G.; Haug, Werner O.; and Kroell, Karl E., T954,008.

International Business Machines: *See—*
Lee, James M.; and Sonoda, George, T954,006.

International Business Machines Corporation: *See—*
Baitinger, Utz G.; Folberth, Otto G.; Haug, Werner O.; and Kroell, Karl E., T954,008.
Brunner, Friedrich C.; Frasch, Peter U.; Schwerdt, Friedrich W.; and Vogtmann, Theodor P., T954,010.
Castrucci, Paul P.; Collins, Robert H.; and Deverse, Frank T., T954,002.
Hassitt, Anthony, T954,011.
Malin, Konrad; and Seybold, Dietrich, T954,009.

Jackson, Winston J., Jr.: *See—*
Dickason, William C.; Jackson, Winston J., Jr.; and Wooten, Willis C., Jr., T954,004.

Kroell, Karl E.: *See—*
Baitinger, Utz G.; Folberth, Otto G.; Haug, Werner O.; and Kroell, Karl E., T954,008.

Lee, James M.; and Sonoda, George, to International Business Machines. On-chip substrate voltage generator. T954,006, 1-4-77, Cl. 307-304.000.

Malin, Konrad; and Seybold, Dietrich, to International Business Machines Corporation. Method for the thermal oxidation of silicon with added chlorine. T954,009, 1-4-77, Cl. 427-93.000.

Mangus, James D., to Westinghouse Electric Corporation. Fluid circulation system for heat exchangers. T954,001, 1-4-77, Cl. 60-682.000.

Nevin, Robert Y.; and Scheer, James Allen, to General Electric Company. Signal enhancement system for radar display. T954,007, 1-4-77, Cl. 343-17.000.

Overton, James R.: *See—*
Davis, Burns; Overton, James R.; and Schulken, Roger M., Jr., T954,005.

Scheer, James Allen: *See—*
Nevin, Robert Y.; and Scheer, James Allen, T954,007.

Schulken, Roger M., Jr.: *See—*
Davis, Burns; Overton, James R.; and Schulken, Roger M., Jr., T954,005.

Schwerdt, Friedrich W.: *See—*
Brunner, Friedrich C.; Frasch, Peter U.; Schwerdt, Friedrich W.; and Vogtmann, Theodor P., T954,010.

Seybold, Dietrich: *See—*
Malin, Konrad; and Seybold, Dietrich, T954,009.

Smith, Robert C., to Firestone Tire and Rubber Company, The. Transparent impact polystyrene plastics. T954,012, 1-4-77, Cl. 526-340.000.

Sonoda, George: *See—*
Lee, James M.; and Sonoda, George, T954,006.

Atomic Energy Commission: *See—*
Basdekas, Demetrios L.; and Bell, George I., T954,003.

Vogtmann, Theodor P.: *See—*
Brunner, Friedrich C.; Frasch, Peter U.; Schwerdt, Friedrich W.; and Vogtmann, Theodor P., T954,010.

Westinghouse Electric Corporation: *See—*
Mangus, James D., T954,001.

Wooten, Willis C., Jr.: *See—*
Dickason, William C.; Jackson, Winston J., Jr.; and Wooten, Willis C., Jr., T954,004.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JANUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abex Corporation: *See—*
Jones, Roger D., Re. 29,096.

Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Method for the preparation of carbon moldings and activated carbon moulding therefrom. Re. 29,101, Cl. 423-449.000.

Avco Corporation: *See—*
Wilson, Jack; and Kantrowitz, Arthur R., Re. 29,103.

Bando Kiko Co., Ltd.: *See—*
Bando, Shigeru, Re. 29,097.

Bando, Shigeru, to Bando Kiko Co., Ltd. Glass plate edge grinding machine. Re. 29,097, Cl. 51-110.000.

Borg-Warner Corporation: *See—*
Hechenbleikner, Ingenuin; and Enlow, William Palmer, Re. 29,098.

Cognitronics Corporation: *See—*
Shepard, David H., Re. 29,104.

Enlow, William Palmer: *See—*
Hechenbleikner, Ingenuin; and Enlow, William Palmer, Re. 29,098.

Exxon Research and Engineering Company: *See—*
Patton, Tad L., Re. 29,100.

Heath, Robert Boyson, to Rainsfords Metal Products Proprietary Ltd. Take-up spool latch. Re. 29,095, Cl. 242-107.700.

Hechenbleikner, Ingenuin; and Enlow, William Palmer, to Borg-Warner Corporation. Preparation of aliphatic phosphates. Re. 29,098, Cl. 204-158.00R.

Johns-Manville Corporation: *See—*
Kietzman, John H.; and Tocci, Mario P., Re. 29,099.

Jones, Roger D., to Abex Corporation. Brake systems. Re. 29,096, Cl. 303-100.000.
Kantrowitz, Arthur R.: *See*—
Wilson, Jack; and Kantrowitz, Arthur R., Re. 29,103.
Kietzman, John H.; and Tocci, Mario P., to Johns-Manville Corporation. Heat stability of asbestos-filled polypropylene. Re. 29,099, Cl. 260-42.450.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, Re. 29,101.
Merz & Co.: *See*—
Scherm, Arthur, Re. 29,102.
Nishimura, Yasushi: *See*—
Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, Re. 29,101.
Patton, Tad L., to Exxon Research and Engineering Company. Selective hydroperoxidation of polyolefins in an aqueous slurry. Re. 29,100, Cl. 526-22.000.
Rainsfords Metal Products Proprietary Ltd.: *See*—
Heath, Robert Boyson, Re. 29,095.
Scherm, Arthur, to Merz & Co. Contraception agent. Re. 29,102, Cl. 424-44.000.
Shepard, David H., to Cognitronics Corporation. Method of scanning documents to read characters thereon without interference from visible marks on the document which are not to be read by the scanner. Re. 29,104, Cl. 340-146.30B.
Tocci, Mario P.: *See*—
Kietzman, John H.; and Tocci, Mario P., Re. 29,099.
Toyo Boseki Kabushiki Kaisha: *See*—
Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, Re. 29,101.
Uehara, Yasuo: *See*—
Amagi, Yasuo; Nishimura, Yasushi; and Uehara, Yasuo, Re. 29,101.
Wilson, Jack; and Kantrowitz, Arthur R., to Avco Corporation. Nitrogen laser action with supersonic flow. Re. 29,103, Cl. 331-94.5PE.

LIST OF PLANT PATENTEES

Danielson, Robert E., to Pan American Plant Company. Chrysanthemum plant named improved yellow dignity. 4,001, 1-4-77, Cl. 78.000.
Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,005.
Mack, Grace H.; Duffett, William E.; and Jessel, Walter H., Jr., 4,004.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,005, 1-4-77, Cl. 75.000.
Jessel, Walter H., Jr.: *See*—
Mack, Grace H.; Duffett, William E.; and Jessel, Walter H., Jr., 4,004.
Mack, Grace H.; Duffett, William E.; and Jessel, Walter H., Jr., to Yoder Brothers, Inc. Chrysanthemum plant. 4,004, 1-4-77, Cl. 75.000.
Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 4,002, 1-4-77, Cl. 68.000.
Mikkelsens, Inc.: *See*—
Mikkelsen, James C., 4,002.
Pan American Plant Company: *See*—
Danielson, Robert E., 4,001.
Weeks, O. L. Rose plant. 4,003, 1-4-77, Cl. 19.000.
Weeks, O. L. Rose plant. 4,006, 1-4-77, Cl. 11.000.
Weeks, O. L. Rose plant. 4,007, 1-4-77, Cl. 12.000.
Weeks, O. L. Rose plant. 4,008, 1-4-77, Cl. 12.000.
Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,005.
Mack, Grace H.; Duffett, William E.; and Jessel, Walter H., Jr., 4,004.

LIST OF DESIGN PATENTEES

AB Calator, a joint stock company: *See*—
Harjapaa, Osmo Viljam, 242,946.
Abbott Laboratories: *See*—
Flinn, Robert Dyall, 242,952.
Manschot, James Gordon; Knox, Kenneth Howard; and Flinn, Robert Dyall, 242,958.
Abe, Kuniomi: *See*—
Masuyama, Kazuo; Abe, Kuniomi; and Maekawa, Yuji, 242,916.
Masuyama, Kazuo; Abe, Kuniomi; and Maekawa, Yuji, 242,917.
Abrahamsen, Thomas C.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., to Burroughs Corporation. Computer module cabinet. 242,926, 1-4-77, Cl. D26-5.00C.
Acroform, Inc.: *See*—
Miller, Jack V., 242,909.
Airway Industries Incorporated: *See*—
Davis, Michael, 242,898.
Arluck, Elmer M., to Thermo-Mold Medical Products, Inc. Orthopedic brace. 242,955, 1-4-77, Cl. D83-1.00J.
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Dasan, Velu K. K., 242,910.
Atlas Copco Aktiebolag: *See*—
Lundmark, Anders Gunnar Rudolf, 242,897.
Aul, Robert J.: *See*—
Miller, James G.; Zitkus, Wayne J.; and Aul, Robert J., 242,956.
Bake, Earl A.; and Stephens, Leonard J., to Rockwell International Corporation. Valve handle. 242,921, 1-4-77, Cl. D23-28.000.
Balleis, Peter. Toy spinning top. 242,939, 1-4-77, Cl. D34-15.00W.
Barber, Stanley. Spanner beam hanger. 242,899, 1-4-77, Cl. D8-235.000.
Beduhn, Jack K.: *See*—
Abrahamsen, Thomas C.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., 242,926.
Benoit, Lucien E. Template for forming panel openings. 242,903, 1-4-77, Cl. D10-64.000.
Benoit, Lucien E. Template for forming panel openings. 242,904, 1-4-77, Cl. D10-64.000.
Blaylock, Arnold O.; Falconer, Robert P.; and Campbell, Charles M., to Lectric Lites Company. Lens cover for emergency warning light. 242,907, 1-4-77, Cl. D10-121.000.
Bluestein, Bernard B., to Sunbeam Corporation. Stand for curler/styler. 242,953, 1-4-77, Cl. D86-10.00A.
Bradford, Isaiah W. Reciprocating electric hair comb. 242,951, 1-4-77, Cl. D86-8.000.
Brown, Lester; Moskowitz, Paul M.; Lax, Michael; and Dziekonski, Robert, to Salton, Inc. Food grinder. 242,892, 1-4-77, Cl. D7-155.000.
Brubaker, Mervin A.; and Brubaker, Myrtle E. Pipe sculpture. 242,933, 1-4-77, Cl. D11-131.000.
Brubaker, Myrtle E.: *See*—
Brubaker, Mervin A.; and Brubaker, Myrtle E., 242,933.
Brudy, Peter E.; and Smith, John. Housing for a revolving lamp. 242,942, 1-4-77, Cl. D48-24.00R.
Buchin, Karl; Grosse, Werner; Klein, Wolfgang; and Wloch, Alfred, to Deutsche Telephonwerke und Kabelindustric Aktiengesellschaft. Telephone handset. 242,928, 1-4-77, Cl. D26-14.00A.
Burroughs Corporation: *See*—
Abrahamsen, Thomas C.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., 242,926.
Campbell, Charles M.: *See*—
Blaylock, Arnold O.; Falconer, Robert P.; and Campbell, Charles M., 242,907.
Car Concepts, Inc.: *See*—
Tedesco, John D., 242,912.
Clamp Mfg. Co., Inc. (Calif. Corporation): *See*—
Saurenman, Phillip E., 242,895.
Csurgay, Gregory. Swimming pool chlorinator. 242,920, 1-4-77, Cl. D23-3.000.
Dasan, Velu K. K., to Ashok Kumar Shetty. Lifting jack. 242,910, 1-4-77, Cl. D12-55.000.
Dattner, Richard. Shelter. 242,923, 1-4-77, Cl. D25-16.000.
Davis, Michael, to Airway Industries Incorporated. Combined closure flap and lock for luggage or the like. 242,898, 1-4-77, Cl. D8-122.000.
De Marco, Thomas J. Toothbrush. 242,883, 1-4-77, Cl. D4-28.000.
Deutsche Telephonwerke unJ Kabelindustrie Aktiengesellschaft: *See*—
Buchin, Karl; Grosse, Werner; Klein, Wolfgang; and Wloch, Alfred, 242,928.
Diamond, Stephen Earl. Font of type. 242,949, 1-4-77, Cl. D64-12.00B.

Diaz, Peter, to Lawrence Peska Associates, Inc., a part interest. Stand for potted plants. 242,884, 1-4-77, Cl. D6-20.000.
Docic, Dusan. Exerciser. 242,936, 1-4-77, Cl. D34-5.00K.
Doyel, John S. Ice cream machine. 242,950, 1-4-77, Cl. D15-82.000.
Duffy, James R.: *See—*
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Dziekonski, Robert: *See—*
Brown, Lester; Moskowitz, Paul M.; Lax, Michael; and Dziekonski, Robert, 242,892.
Eckman, Philip W.: *See—*
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Ehrlin, Hans Tage Alfred; and Haggstam, Christian Gunnar, to Stiga AB. Combined self-propelled articulated tractor with lawn mower apparatus. 242,940, 1-4-77, Cl. D15-15.000.
Erwin Weller Company: *See—*
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Falconer, Robert P.: *See—*
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Flinn, Robert Dyall: *See—*
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Goller, Robert L.: *See—*
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Gould Inc.: *See—*
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Graham, Glenn N., to Wyott Corporation. Deep fat fryer. 242,947, 1-4-77, Cl. D15-104.000.
Grimaldo, Samuel; and Watling, Leighton Harvey. Tube bender. 242,948, 1-4-77, Cl. D15-123.000.
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Hackmyer, Saul A. Combined razor blade cartridge holder and lather dispensing cap. 242,902, 1-4-77, Cl. D9-261.000.
Haggstam, Christian Gunnar: *See—*
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Harjapaa, Osmo Viljam, to AB Calator, a joint stock company. Folding and smoothing machine for skirts and the like. 242,946, 1-4-77, Cl. D15-42.000.
Harris, Allan E.: *See—*
Harris, Kenneth W., 242,894.
Harris, Kenneth W., to Harris, Allan E.; Harris, Roger T.; and Eckman, Philip W. Sprinkler head grass trimmer. 242,894, 1-4-77, Cl. D8-8.000.
Harris, Roger T.: *See—*
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Hauenstein, Max C., to General Electric Company. Electric coffeemaker or similar article. 242,891, 1-4-77, Cl. D7-59.000.
Higgins, Denis C.: *See—*
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Hillman, Douglas C.; and Solomon, Herbert J., to Uniroyal, Inc. Footwear display stand. 242,889, 1-4-77, Cl. D6-157.000.
Hillman, Douglas C.; and Solomon, Herbert J., to Uniroyal, Inc. Footwear display stand. 242,890, 1-4-77, Cl. D6-186.000.
Hoerner Waldorf Corporation: *See—*
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Jackson, Joseph Monroe; and Ronen, Shai, to Litton Business Telephone Systems, Inc. Membrane switch assembly font. 242,930, 1-4-77, Cl. D26-14.00A.
Jones, Richard F., to General Aquadyne, Inc. Diver's helmet. 242,881, 1-4-77, Cl. D2-232.000.
Kaiser, Richard B.; and Higgins, Denis C. Cigarette holder. 242,931, 1-4-77, Cl. D27-2.000.
Kilburn, Ronald L.; and Fellion, James E., to H.F.E., Inc. Bean harvester. 242,914, 1-4-77, Cl. D15-27.000.
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Knox, Kenneth Howard: *See—*
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Konan Camera Research Institute: *See—*
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Masuyama, Kazuo; Abe, Kuniomi; and Maekawa, Yuji, 242,917.
Kurose, Keamon. Boat. 242,911, 1-4-77, Cl. D12-66.000.
Lar Ricu, Barry J. Copy holder for a typist or the like. 242,918, 1-4-77, Cl. D19-91.000.
Larson, Bernard. Carburetor air filter tester. 242,906, 1-4-77, Cl. D10-96.000.
Lawrence Peska Associates, Inc.: *See—*
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Lax, Michael: *See—*
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Lundmark, Anders Gunnar Rudolf, to Atlas Copco Aktiebolag. Handle for a percussive tool, or the like. 242,897, 1-4-77, Cl. D8-107.000.
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Masuyama, Kazuo; Abe, Kuniomi; and Maekawa, Yuji, to Konan Camera Research Institute. Microscope optical assembly. 242,917, 1-4-77, Cl. D16-58.000.
Mazie, Lowell I.; Massey, Miles; and Stopyra, Joseph. Shelf to be attached to pegboards or the like. 242,888, 1-4-77, Cl. D6-136.000.
McKnight, Charles E. Underground tornado shelter. 242,924, 1-4-77, Cl. D25-36.000.
Medler, Albert, to Plastigage Corporation. Thimble end strain insulator fitting. 242,927, 1-4-77, Cl. D26-10.000.
Miller, Jack V., to Acroform, Inc. Auto mechanic's creeper. 242,909, 1-4-77, Cl. D12-31.000.
Miller, James G.; Zitkus, Wayne J.; and Aul, Robert J., to Owens-Illinois, Inc. Lung exercise device. 242,956, 1-4-77, Cl. D83-1.000.
Monninger, Robert C. Combined heat collector and diffuser. 242,922, 1-4-77, Cl. D23-127.000.
Montague, Douglas P.; and Morrison, Howard J., to Marvin Glass & Associates. Pole telephone. 242,929, 1-4-77, Cl. D26-14.00A.
Moore, Charles R. Dual lamp. 242,944, 1-4-77, Cl. D48-20.00K.
Moore, Charles R. Lamp. 242,945, 1-4-77, Cl. D48-20.00K.
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Oscar Mayer & Co. Inc.: *See—*
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Owens-Illinois, Inc.: *See—*
Miller, James G.; Zitkus, Wayne J.; and Aul, Robert J., 242,956.
Petersen, Harry, Jr. Retrievable fish hook. 242,919, 1-4-77, Cl. D22-30.000.
Petty, Preston L. Motorcycle fender. 242,913, 1-4-77, Cl. D12-186.000.
Plastigage Corporation: *See—*
Medler, Albert, 242,927.
Poliquin, Richard D. Pool cue tip file. 242,896, 1-4-77, Cl. D8-90.000.
Potter, Taylor M. Seat or similar article. 242,886, 1-4-77, Cl. D6-73.000.
Radloff, Harry L.: *See—*
Seiferth, Oscar E.; Grindrod, Paul E.; Goller, Robert L.; and Radloff, Harry L., 242,900.
Rand, Robert W. Surgical pledgets. 242,954, 1-4-77, Cl. D83-1.00A.
Richards Manufacturing Company, Inc.: *See—*
Treace, James T., 242,957.
Rockwell International Corporation: *See—*
Bake, Earl A.; and Stephens, Leonard J., 242,921.
Ronen, Shai: *See—*
Jackson, Joseph Monroe; and Ronen, Shai, 242,930.
Saito, Tatsuya, to Sanwa Cutlery Co., Ltd. Nail clipper. 242,959, 1-4-77, Cl. D86-10.00B.
Salter, Athol John William. Folding ladder. 242,925, 1-4-77, Cl. D25-64.000.
Salton, Inc.: *See—*
Brown, Lester; Moskowitz, Paul M.; Lax, Michael; and Dziekonski, Robert, 242,892.
Sanwa Cutlery Co., Ltd.: *See—*
Saito, Tatsuya, 242,959.

Saurenman, Phillip E., to Clamp Mfg. Co., Inc. (Calif. Corporation). Wrench. 242,895, 1-4-77, Cl. D8-29.000.
Schneider, Otto W., to Erwin Weller Company. Combined brush and ice scraper. 242,882, 1-4-77, Cl. D4-06.000.
Seider, Gene J.; and Duffy, James R., to Gould Inc. Mobile service vehicle. 242,908, 1-4-77, Cl. D12-22.000.
Seiferth, Oscar E.; Grindrod, Paul E.; Goller, Robert L.; and Radloff, Harry L., to Oscar Mayer & Co. Inc. Multi-unit, individually removable, food dispensing package. 242,900, 1-4-77, Cl. D9-191.000.
Sickul, Joan B. Ashtray. 242,932, 1-4-77, Cl. D27-22.000.
Silver, Louis J. Holder for a scouring implement. 242,893, 1-4-77, Cl. D7-178.000.
Smith, John: *See*—
Brudy, Peter E.; and Smith, John, 242,942.
Solar Lighting Corporation: *See*—
Lazerson, Bernard, 242,943.
Solomon, Herbert J.: *See*—
Hillman, Douglas C.; and Solomon, Herbert J., 242,889.
Hillman, Douglas C.; and Solomon, Herbert J., 242,890.
Stanley, William J. Coin wallet. 242,960, 1-4-77, Cl. D87-3.00B.
Stephens, Leonard J.: *See*—
Bake, Earl A.; and Stephens, Leonard J., 242,921.
Stiga AB: *See*—
Ehrlin, Hans Tage Alfred; and Haggstam, Christian Gunnar, 242,940.
Stopyra, Joseph: *See*—
Mazie, Lowell I.; Massey, Miles; and Stopyra, Joseph, 242,888.
Sunbeam Corporation: *See*—
Bluestein, Bernard B., 242,953.
Takahashi, Osamu. Toy trampoline. 242,935, 1-4-77, Cl. D34-5.00K.
Tedesco, John D., to Car Concepts, Inc. Automobile. 242,912, 1-4-77, Cl. D12-92.000.
Thermo-Mold Medical Products, Inc.: *See*—
Arluck, Elmer M., 242,955.
Treace, James T., to Richards Manufacturing Company, Inc. Total ankle prosthesis. 242,957, 1-4-77, Cl. D83-1.00E.
Tsukuda, Mitsuo. Game board. 242,934, 1-4-77, Cl. D34-5.0SS.
Uniroyal, Inc.: *See*—
Hillman, Douglas C.; and Solomon, Herbert J., 242,889.
Hillman, Douglas C.; and Solomon, Herbert J., 242,890.
Wang, Robert O. Transparency viewer. 242,915, 1-4-77, Cl. D16-14.000.
Watling, Leighton Harvey: *See*—
Grimaldo, Samuel; and Watling, Leighton Harvey, 242,948.
Williams, Roy G. Training tennis racquet. 242,937, 1-4-77, Cl. D34-5.0ST.
Wise, Charles W. Storage rack for attachment to wall lockers or the like. 242,887, 1-4-77, Cl. D6-131.000.
Wloch, Alfred: *See*—
Buchin, Karl; Grosse, Werner; Klein, Wolfgang; and Wloch, Alfred, 242,928.
Wyott Corporation: *See*—
Graham, Glenn N., 242,947.
Zitkus, Wayne J.: *See*—
Miller, James G.; Zitkus, Wayne J.; and Aul, Robert J., 242,956.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 4, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

114	4,000,521
141 R	4,000,522
150	4,000,523
161 R	4,000,524
418	4,000,520

CLASS 3

1.911	4,000,525

CLASS 4

57 P	4,000,526
172.12	4,000,527
180	4,000,528

CLASS 5

37 R	4,000,529
87	4,000,530
267	4,000,531

CLASS 8

1 E	4,000,966
14	4,000,964
26	4,000,965
115.5	4,000,967
158	4,000,968
173	4,000,969
178 R	4,000,970

CLASS 9

8 R	4,000,532
9	4,000,533
342	4,000,534

CLASS 12

126	4,000,535

CLASS 13

24	4,001,487
33	4,001,488

CLASS 15

50 A	4,000,536
230.11	4,000,537
320	4,000,538

CLASS 16

121	4,000,539
151	4,000,540

CLASS 19

81	4,000,541

CLASS 21

63	4,000,971

CLASS 23

230 B	4,000,972
	4,000,975
230 R	4,000,973
	4,000,974
259	4,000,976
273 V	4,000,977
277 R	4,000,978

CLASS 24

71 J	4,000,542
150 R	4,000,543
201 CF	4,000,544
205 R	4,000,545
205.1 R	4,000,546
214	4,000,547
230 AL	4,000,548
263 KS	4,000,549

CLASS 28

64	4,000,550
72.12	4,000,551

CLASS 29

76 R	4,000,552
115	4,000,553
	4,000,979
182.3	4,000,982
182.5	4,000,980
	4,000,981
	4,000,983
183	4,000,984
252	4,000,554
417	4,000,555
427	4,000,556
525	4,000,557
625	4,000,558

CLASS 30

41.6	4,000,560
124	4,000,561
133	4,000,562

CLASS 34

10	4,000,563

CLASS 35

17	4,000,564
35 A	4,000,565

CLASS 36

28	4,000,566
117	4,000,567

CLASS 37

69	4,000,568

CLASS 38

135	4,000,569

CLASS 40

1.5	4,000,570
19.5	4,000,571
63 A	4,000,572
142 R	4,000,573

CLASS 42

1 S	4,000,574
44	4,000,575

CLASS 43

5	4,000,576
55	4,000,577
92	4,000,578

CLASS 44

59	4,000,985
62	4,000,986

CLASS 46

154	4,000,579

CLASS 47

14	4,000,580

CLASS 48

214 A	4,000,987
	4,000,988

CLASS 49

103	4,000,581
218	4,000,582

CLASS 51

110	Re.29,097
135 R	4,000,583
241 VS	4,000,584

CLASS 52

2	4,000,585
9	4,000,586
16	4,000,587
71	4,000,588
79.5	4,000,589
106	4,000,590
125	4,000,591
149	4,000,592
172	4,000,593
241	4,000,594
302	4,000,595
481	4,000,596
716	4,000,597

CLASS 53

123	4,000,598
378	4,000,599

CLASS 55

18	4,000,989
30	4,000,990
48	4,000,991
87	4,000,992
94	4,000,993
112	4,000,994
282	4,000,995

CLASS 56

220	4,000,600
328 R	4,000,601
	4,000,602

CLASS 57

87	4,000,603
153	4,000,604
157 TS	4,000,605

CLASS 59

16	4,000,606

CLASS 60

39.03	4,000,607
39.36	4,000,608
	4,000,609
230	4,000,610
	4,000,611
	4,000,612
251	4,000,613
276	4,000,614
277	4,000,615
420	4,000,616
644	4,000,617

CLASS 61

1 F	4,000,618
3	4,000,619
12	4,000,620
35	4,000,621
39	4,000,622
	4,000,623
88	4,000,624

CLASS 62

4	4,000,996
63	4,000,625
175	4,000,626

CLASS 63

2	4,000,627

CLASS 64

17 A	4,000,628
21	4,000,629

CLASS 65

23	4,000,997
33	4,000,998
49	4,000,999
59 A	4,001,000
337	4,001,001

CLASS 66

177	4,000,630

CLASS 68

23.7	4,000,631

CLASS 70

165	4,000,632
	4,000,633

CLASS 71

65	4,001,002
88	4,001,003
100	4,001,004
108	4,001,005
117	4,001,006

CLASS 72

69	4,000,634
148	4,000,635
173	4,000,636
226	4,000,637
238	4,000,638
316	4,000,639

CLASS 73

1 B	4,000,640
9	4,000,641
15 R	4,000,642
88.5 R	4,000,643
95	4,000,644
155	4,000,645
170 A	4,000,646
181	4,000,647
189	4,000,648
219	4,000,649
290 V	4,000,650
314	4,000,651
336	4,000,652
343 R	4,000,653
422 GC	4,000,654
432 R	4,000,655
	4,000,656
448	4,000,657
490	4,000,658
514	4,000,659

CLASS 74

5.43	4,000,660
89.15	4,000,661
331	4,000,662
424.8 R	4,000,664
424.8 VA	4,000,663
572	4,000,665
604	4,000,666

CLASS 75

5	4,001,007
11	4,001,008
13	4,001,009
35	4,001,010
40	4,001,011
51	4,001,012
72	4,001,013

CLASS 76

101 R	4,000,667

CLASS 81

55	4,000,668

CLASS 82

33 R	4,000,669

CLASS 83

42	4,000,670
	4,000,671
203	4,000,672
526	4,000,673

CLASS 84

1.01	4,000,674
	4,000,675
1.25	4,000,676
375	4,000,677
453	4,000,678
464	4,000,679

CLASS 85

37	4,000,680
62	4,000,681

CLASS 86

1 R	4,000,682

CLASS 91

411 R	4,000,683
447	4,000,684
469	4,000,685

CLASS 93

36 A	4,000,686
53 M	4,000,687

CLASS 96

1.5	4,001,014
33	4,001,015
35.1	4,001,016
	4,001,017
36.1	4,001,018
66 R	4,001,021
66.3	4,001,020
76 R	4,001,022
87 A	4,001,023
87 R	4,001,024
107	4,001,025
114.1	4,001,026

CLASS 98

42 A	4,000,688

CLASS 100

229 A	4,000,689

CLASS 101

36	4,000,690
136	4,000,691
144	4,000,692
183	4,000,693
365	4,000,694
	4,000,695

CLASS 102

24 R	4,000,696
38	4,000,697
93	4,000,698

CLASS 104

2	4,000,699
130	4,000,700
138 R	4,000,701
244	4,000,702

CLASS 105

377	4,000,703

CLASS 106

23	4,001,027
54	4,001,019
62	4,001,028
67	4,001,029
100	4,001,030
	4,001,031
213	4,001,032
287 SS	4,001,033
292	4,001,034
307	4,001,035

CLASS 108

53.1	4,000,704

CLASS 110

3	4,000,705

CLASS 112

221	4,000,706
410	4,000,707

CLASS 113

18 R	4,000,708
114 BG	4,000,709

CLASS 114

67 A	4,000,710
74 A	4,000,711
77 R	4,000,712
248	4,000,714
294	4,000,713

CLASS 116

137 R	4,000,715

CLASS 118

5	4,000,716
49	4,000,717

CLASS 119

14.03	4,000,718
51.13	4,000,719

CLASS 122

510	4,000,720

CLASS 123

8.01	4,000,721
30 D	4,000,722
73 AA	4,000,723
117 R	4,000,724
119 CD	4,000,725
134	4,000,726
136	4,000,727
140 R	4,000,728
148 DS	4,000,729
189	4,000,730
191 S	4,000,731

CLASS 126

92 R	4,000,732
270	4,000,733
271	4,000,734
361	4,000,735

CLASS 128

80 R	4,000,736
154	4,000,737
214 D	4,000,738
214 R	4,000,740
214.4	4,000,739
218 NV	4,000,741
229	4,000,742
303 R	4,000,743
330	4,000,744
418	4,000,745
526	4,000,746

CLASS 130

30 C	4,000,747

CLASS 131

140 C	4,000,748

CLASS 134

38	4,001,038

CLASS 135

1 R	4,000,749
16	4,000,750

CLASS 136

205	4,001,046
230	4,001,045

CLASS 137

101	4,000,751
118	4,000,752
296	4,000,753
487	4,000,754
595	4,000,755
596.17	4,000,756
834	4,000,757

CLASS 138

31	4,000,758
130	4,000,759
141	4,000,760

CLASS 139

66 R	4,000,761
452	4,000,762

CLASS 140

82	4,000,763
113	4,000,764

CLASS 141

181	4,000,765

CLASS 144

144 R	4,000,766

CLASS 145

61 L	4,000,767

CLASS 148

1.5	4,001,047
	4,001,048
	4,001,049
	4,001,050
9 R	4,001,051
12 C	4,001,052
12.9	4,001,053
16.5	4,001,054
172	4,001,055
175	4,001,056
187	4,001,465

CLASS 149

19.3	4,001,057
22	4,001,058
109.4	4,001,059
109.6	4,001,060

CLASS 150

3	4,000,768
52 J	4,000,769

CLASS 156

3	4,001,061
59	4,001,062
73.1	4,001,063
73.6	4,001,064
86	4,001,065
152	4,001,066
159	4,001,067
315	4,001,068
353	4,001,069
398	4,001,070
435	4,001,071
461	4,001,072
516	4,001,073
580	4,001,074
581	4,001,075
624	4,001,076

CLASS 159

4 S	4,001,077

CLASS 164

21	4,000,770
64	4,000,771
194	4,000,772
281 R	4,000,773

CLASS 165

4	4,000,774
8	4,000,775
32	4,000,776
86	4,000,777
	4,000,778
111	4,000,779

CLASS 166

72 4,000,780
276 4,000,781

CLASS 173

12 4,000,782

CLASS 174

10 4,001,489
88 R 4,001,490
209 4,001,491

CLASS 175

346 4,000,783

CLASS 176

35 4,001,078
87 4,001,079

CLASS 178

68 4,001,504

CLASS 179

1 H 4,001,506
1 SC 4,001,505
2 DP 4,001,507
6 D 4,001,508
7.1 R 4,001,509
15 FD 4,001,510
15 FS 4,001,511
17 A 4,001,512
18 DA 4,001,513
18 FC 4,001,514
18 HB 4,001,515
81 R 4,001,520
84 R 4,001,516
84 VF 4,001,521
99 4,001,517
100.4 ST 4,001,518
100.41 G 4,001,519
115 V 4,001,522
4,001,523
170 T 4,001,524
175.31 R 4,001,525

CLASS 180

9.48 4,000,784
143 4,000,785

CLASS 181

52 4,000,786

CLASS 182

2 4,000,787
92 4,000,788
152 4,000,789

CLASS 184

27 R 4,000,790

CLASS 188

71.5 4,000,791
242 4,000,792

CLASS 192

105 A 4,000,793
106.2 4,000,794
109 F 4,000,795

CLASS 193

35 A 4,000,796
38 4,000,797
40 4,000,798

CLASS 194

1 L 4,000,799
9 R 4,000,800

CLASS 195

1.8 4,001,080
29 4,001,081
31 F 4,001,082
65 4,001,083
4,001,084
68 4,001,085
81 4,001,086
103.5 R 4,001,087
4,001,088
4,001,089
109 4,001,090

CLASS 196

46 4,001,091

CLASS 197

1 R 4,000,801
27 4,000,802
133 R 4,000,803
151 4,000,804

CLASS 198

320 4,000,805
443 4,000,806
4,000,807
572 4,000,808
819 4,000,809

CLASS 200

16 D 4,001,526
38 FB 4,001,527
38 R 4,001,528
39 R 4,001,529
48 A 4,001,530
61.04 4,001,531
61.45 R 4,001,185
61.58 B 4,001,532
84 C 4,001,533
160 4,001,534
340 4,001,535

CLASS 202

262 4,001,092

CLASS 204

15 4,001,093
129.6 4,001,094
157.1 R 4,001,095
158 R Re.29,098
4,001,096
159.16 4,001,097
159.23 4,001,098
164 4,001,099
180 R 4,001,100
181 4,001,101
186 4,001,102
195 R 4,001,103
243 R 4,001,104

CLASS 206

5 4,000,810
44 R 4,000,811
87 4,000,812
187 4,000,813
4,000,814
205 4,000,815
498 4,000,816
505 4,000,817

CLASS 208

11 R 4,001,105
75 4,001,106
323 4,001,107

CLASS 210

12 4,001,108
22 A 4,001,110
22 R 4,001,109
24 4,001,111
31 C 4,001,112
33 4,001,113
44 4,001,114
67 4,001,115
83 4,001,116
180 4,001,117
187 4,001,118
402 4,001,119
420 4,001,120
512 R 4,001,121
516 4,001,122

CLASS 214

1 CM 4,000,819
1 P 4,000,818
6 DK 4,000,820
8.5 F 4,000,821
10 4,000,822
86 A 4,000,823

CLASS 215

232 4,000,824
318 4,000,825

CLASS 219

10.55 B 4,001,536
4,001,537
69 M 4,001,538
110 4,001,539
4,001,540
117 R 4,001,542
121 L 4,001,543
216 4,001,541
4,001,544
4,001,545
4,001,546
322 4,001,547
388 4,001,548

CLASS 220

3 4,000,826
4 F 4,000,827
203 4,000,828
265 4,000,829
369 4,000,830

CLASS 221

196 4,000,831
232 4,000,832

CLASS 222

105 4,000,833
180 4,000,834
183 4,000,835
399 4,000,836
512 4,000,837
529 4,000,838
540 4,000,839
607 4,000,840

CLASS 224

48 R 4,000,841

CLASS 228

180 A 4,000,842

CLASS 229

14 C 4,000,843
15 4,000,844
4,000,845
62.5 4,000,846

CLASS 232

35 4,000,847

CLASS 235

61.12 R 4,001,549
61.7 B 4,001,550
70 A 4,001,551
92 DN 4,001,552
92 MS 4,001,553
150 4,001,554
150.53 4,001,555
151 4,001,556
151.1 4,001,557
151.11 4,001,558
151.31 4,001,559
151.32 4,001,560
4,001,561
4,001,562
152 4,001,563
4,001,564
4,001,565
156 4,001,568
4,001,569
159 4,001,566
170 4,001,567
174 4,001,570

CLASS 236

68 R 4,000,848
100 4,000,849

CLASS 237

1 A 4,000,850
4,000,851

CLASS 239

102 4,000,852
230 4,000,853
265.35 4,000,854
265.39 4,000,855
332 4,000,856
428.5 4,000,857

CLASS 240

9 R 4,001,571
25 4,001,572
64 4,001,573
78 E 4,001,574
81 LD 4,001,575
108 B 4,001,576

CLASS 241

27 4,000,858
194 4,000,859
242 4,000,860
282.1 4,000,861

CLASS 242

7.06 4,000,862
56 R 4,000,863
59 4,000,864
75.43 4,000,865
107.7 Re.29,095
203 4,000,866

CLASS 244

1 TD 4,000,867
12.5 4,000,868
53 B 4,000,869
118 R 4,000,870
119 4,000,871

CLASS 246

182 R 4,000,872

CLASS 248

2 4,000,873
27.1 4,000,874
56 4,000,875
205 R 4,000,876

CLASS 249

82 4,000,877

CLASS 250

199 4,001,577
4,001,578
223 R 4,001,579
239 4,001,581
288 4,001,582
303 4,001,583
328 4,001,584
4,001,585
336 4,001,589
4,001,590
345 4,001,586
363 S 4,001,580
4,001,591
474 4,001,587
476 4,001,592
493 4,001,588
522 4,001,593
559 4,001,594
575 4,001,595

CLASS 251

127 4,000,878

CLASS 252

8.8 4,001,123
12 4,001,124
29 4,001,125
62 4,001,126
62.9 4,001,127
63.2 4,001,128
78.5 4,001,129
89 B 4,001,130
99 4,001,131
105 4,001,132
156 4,001,133
180 4,001,134
187 R 4,001,135
4,001,136
299 4,001,137
301.17 4,001,139
301.27 4,001,138
316 4,001,140
351 4,001,141
408 4,001,142
462 4,001,143
463 4,001,144
513 4,001,145
514 4,001,146

CLASS 254

29 R 4,000,879
103 4,000,880
157 4,000,881

CLASS 256

13.1 4,000,882
65 4,000,883

CLASS 259

191 4,000,884

CLASS 260

2.5 B 4,001,147
2.5 F 4,001,148
2.5 FP 4,001,149
17 R 4,001,150
17.4 ST 4,001,151
18 N 4,001,152
22 CB 4,001,153
29.2 EP 4,001,155
4,001,156
29.4 UA 4,001,154
4,001,157
29.6 H 4,001,161
29.6 SQ 4,001,162
29.6 TA 4,001,158
4,001,159
29.6 WA 4,001,160
29.7 T 4,001,163
31.8 N 4,001,164
33.6 AQ 4,001,167
33.6 UB 4,001,165
4,001,166
37 SB 4,001,168
40 P 4,001,169
4,001,170
40 R 4,001,171
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52 4,001,617

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DEFENSIVE PUBLICATIONS APPLICATIONS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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4 : 4,000,607
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DESIGN PATENTS

5	:	242,899			242,948			242,906	19	:	242,882
6	:	242,881			242,949			242,912			242,919
		242,893			242,951			242,920	26	:	242,926
		242,895			242,954	17	:	242,922			242,927
		242,896			242,957			242,929	27	:	242,908
		242,901	8	:	242,914			242,943	34	:	242,936
		242,909	9	:	242,889			242,952	36	:	242,884
		242,918			242,890			242,953			242,892
		242,930			242,891	18	:	242,924			242,923
		242,931			242,932			242,944			242,950
		242,941	12	:	242,902			242,945			242,955

37	:	242,937			242,904
39	:	242,883	47	:	242,887
		242,885	48	:	242,894
		242,956			242,907
41	:	242,886	53	:	242,911
		242,913	55	:	242,900
42	:	242,888			242,905
		242,898			242,915
		242,921			242,958
		242,933			242,947
44	:	242,903	56	:	

PLANT PATENTS

6	:	4,003			4,007						
		4,006			4,008	9	:	4,004	17	:	4,001

39	:	4,002			4,005

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

6	:	T954,011	36	:	T954,002			T954,007						
24	:	T954,003			T954,006	39	:	T954,012	42	:	T954,001	47	:	T954,004

		T954,005

U. S. GOVERNMENT PRINTING OFFICE : O - 1977

U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*